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March 20, 2008

Alex M. Barron
Fish Tissue and Sediment Monitoring Program
Virginia Department of Environmental Quality
P.O. Box 1105
Richmond, VA 23218

RE: Louisa County Regional Wastewater Treatment Plant Expansion
Final Streamlined Water Effects Ratio Report

Dear Mr. Barron:

Please find enclosed an updated report for the Louisa County Regional Wastewater Treatment Plant (WWTP) Streamlined Water-Effect-Ratio (WER) for Copper. The final report includes supplemental sampling carried out in February 2008 to address concerns raised by DEQ over one of the original samples reported in 2007. The original sample, collected in July 2007, had a Total Suspended Solids measurement of 81 mg/l which was significantly higher than the permitted limit of 15 mg/l (weekly average).

The third effluent sample was collected on February 20, 2008. The CBOD in the effluent was non-detect (<2.0 mg/l), ammonia was 0.28 mg/l, and TSS was 10 mg/l. All of these parameters were within the permitted discharge limits, indicating that the WWTP was operating normally during the sampling event.

The WER value for the February study is 16.94. The final WER value, utilizing the original May 2007 data and the February 2008 data, is 15.70.

If you have any questions concerning this WER report please feel free to give me a call.

Sincerely,
Dewberry & Davis, Inc.

J. Ryan Moyers, P.E.
Project Engineer

Enclosures
cc: Alison Thompson, DEQ NVRO w/ Enclosure
Bar Delk, LCWA w/ Enclosure
Brian Marks, Town of Louisa w/o Enclosure
Dick Sedgley, AquaLaw w/ Enclosure

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STREAMLINED WER FOR COPPER REPORT SUPPLEMENTAL SAMPING EVENT

LOUISA COUNTY WATER AUTHORITY: LOUISA REGIONAL STP

MARCH 2008

REPORT SUBMITTED TO:
DEWBERRY
GLEN ALLEN, VIRGINIA

SHEALY ENVIRONMENTAL SERVICES, INC.

BIOLOGISTS, TOXICOLOGISTS & CHEMISTS

STREAMLINED WER FOR COPPER REPORT SUPPLEMENTAL SAMPING EVENT

LOUISA COUNTY WATER AUTHORITY: LOUISA REGIONAL STP

MARCH 2008

REPORT SUBMITTED TO:
DEWBERRY
GLEN ALLEN, VIRGINIA

REPORT SUBMITTED BY:

Elizabeth D. Thompson

SHEALY ENVIRONMENTAL SERVICES, INC.
1833 Airport Boulevard, Suite D
West Columbia, South Carolina 29172

STREAMLINED WER FOR COPPER REPORT SUPPLEMENTAL SAMPING EVENT

LOUISA COUNTY WATER AUTHORITY: LOUISA REGIONAL STP

MARCH 2008

This report includes a full text account of the February 20, 2008, sampling event and WER study for copper. The attached appendices contain all raw data including sampling data, toxicity test reports, and analytical reports:

Appendix A: Sample Collection Data

Appendix B: Toxicity Test Reports

Appendix C: Analytical Reports

Appendix D: Copper Toxicity Control Chart

STREAMLINED WER FOR COPPER FULL TEXT REPORT SUPPLEMENTARY SAMPLING

LOUISA COUNTY WATER AUTHORITY: LOUISA REGIONAL STP

MARCH 2008

SECTION 1: Introduction

The Louisa County Water Authority owns and operates the Louisa Regional STP near the intersection of State Route 22 and U.S. Route 33. The facility discharges into Beaver Creek in the York River Basin. The facility has a discharge permit, (VA0067954), which has a proposed monthly average copper limit of 0.0055 mg/L as total recoverable, and a weekly average copper limit of 0.0055 mg/L. Because the National Criteria for metals published by the USEPA are admittedly overly-protective for many facilities and their receiving streams, the USEPA (1994) and the State of Virginia (9VAC25-260F) have allowed the development of site-specific criteria. One method of developing site-specific metals criteria is the Water-Effect Ratio (WER) study. A WER study produces a multiplier which may be applied to the EPA's National Criteria for copper, thus increasing the facility's final permit limits for copper.

In conjunction with Dewberry, a copper Streamlined WER study was performed in 2007 for the Louisa Regional STP by Shealy Environmental Services, Inc. Two studies were completed in accordance with the Streamlined Method. The first was performed on May 16, 2007. Effluent and receiving stream samples were collected May 14-15, 2007. The WER determined with *Ceriodaphnia dubia* (a freshwater invertebrate in the family Cladocera) was 14.56 for total copper. The second WER study was performed July 18, 2007, using effluent and receiving stream samples collected July 16-17, 2007. The resulting total copper WER value was 23.11 for total copper. The final water-effect ratio (FWER) was determined as the geometric mean of the two *C. dubia* WER values. The FWER developed for the Louisa Regional STP was 18.34.

Upon technical review by the State of Virginia Department of Environmental Quality (DEQ), it was noted that the total suspended solids (TSS) measurement on the July sample was elevated. Because the TSS measurement of 81 mg/L was significantly higher than the permitted limit of 15 mg/L (weekly average), the effluent sample was considered atypical. A third sampling event was requested by VADEQ in January of 2008.

In response to the VADEQ request for additional sampling, personnel of Shealy Environmental Services, Inc. collected a third composited effluent sample at the Louisa Regional STP on February 20, 2008. All chemical parameters were in compliance with monitoring requirements. With a WER value for the study of 16.94, the new final WER (FWER) value calculated using the May 2007 and the February 2008 data is 15.70.

The study adhered to EPA 823-B-94-001, *Interim Guidance on Determination and Use of Water-Effect Ratios for Metals*, as well as the Streamlined Method document, *Streamlined Water-Effect Ratio Procedure for Discharges of Copper* (EPA-822-R-01-005). For detailed toxicity testing guidance, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, EPA 821-R-02-012, was used.

Section 2: Copper Water-Effect Ratio Study #3

2.1 Sampling Information

On February 19, 2008, an ISCO® composite sampler was set-up by personnel of Shealy Environmental Services, Inc. at the Louisa STP to collect final effluent from the flume following ultra-violet disinfection. The compositor unit was fitted with Teflon® tubing and a Teflon®-lined strainer. All equipment including the glass collection jar, strainer, and tubing, was acid-washed prior to use. De-ionized laboratory water was pumped through the compositing unit, and an aliquot was preserved with nitric acid for total copper analysis as an equipment blank. The compositor was programmed to begin sampling at 1200 on February 19, 2008, and to collect 150 ml of effluent every 15 minutes for 24 hours. The effluent temperature at sample collection was 9.2°C, the effluent pH was 6.70 SU, and the effluent TRC measured <0.1 mg/L.

On February 20, 2008, a filtration station was set-up adjacent to the compositing unit on clean plastic sheeting in order to filter upstream water and effluent at 0.45 microns for dissolved metals analysis. The station consisted of a vacuum pump and two sealed, disposable Nalgene® filter units. During sampling and filtration, one technician was designated to have 'clean' hands, and one 'dirty' hands. Both technicians wore non-powdered nitrile gloves.

Two gallons of receiving stream water were collected from Beaver Creek upstream from the treatment plant outfall on February 20, 2008, at 1000. Samples were taken at a point approximately half-way between the outfall and the pipe running under the golf course bridge. Beaver Creek flow above the STP outfall was determined to be 0.172 MGD with a Global Water® digital flow probe. The receiving stream temperature was 3.9°C, and the pH was 7.42 SU. The Beaver Creek sample was transported to the filtration station. De-ionized water was pumped through one of the filter units at 1045 and preserved with nitric acid as a filtration blank for copper. At 1050, an aliquot of upstream water was filtered and preserved with nitric acid for dissolved metals analysis. An unfiltered aliquot of upstream water was preserved with nitric acid for total metals analysis.

The effluent sample was removed from the compositing unit at 1158 on February 20, 2008. A filtration blank was collected using a new Nalgene® filtration unit at 1205. At 1210, an aliquot of effluent was immediately filtered and preserved for dissolved metals analysis. An unfiltered aliquot was preserved with nitric acid for total metals analysis.

Samples were packed on ice for transport. The samples were received at the Shealy Environmental Services Inc., Main Laboratory on February 21, 2008, at 0930. The TRC of the effluent measured at sample receipt was 0 mg/L. A receipt temperature of 3.8°C was documented for the temperature blank in the sample cooler. The effluent sample was assigned the unique lot number JB21066, and the receiving stream was assigned the unique lot number JB21068. The samples were maintained in a walk-in refrigeration unit set between 0 and 4°C until transferred to the Toxicity Laboratory at 1833 Airport Boulevard.

Weather conditions for 14 days prior to sample collection were obtained from monitoring reports provided by the National Weather Service for the Louisa Regional Airport. The compositor and filtration blanks contained less than 1 µg/L copper. Analytical reports are in Appendix C. All other sampling data including Chain-of-Custody forms, weather history, and receiving stream flow data are provided in Appendix A.

2.2 Sampling Conditions

Receiving stream flow during sample collection was reported as 0.172 MGD upstream from the WWTP outfall. The WWTP flow during sampling was 0.30365 MGD. The CBOD measured in the effluent was non-detect (<2.0 mg/L), ammonia was 0.28 mg/L, and TSS was 10 mg/L. All of these parameters were within the permitted discharge limits, indicating that the WWTP was operating normally during the sampling event.

2.3 Copper Source for Study #3

The copper source for Study #3 was cupric sulfate pentahydrate ($CuSO_4*5H_2O$) obtained from Fisher Scientific. The Fisher lot number for the copper used was 063393, and the container of cupric sulfate designated as SHEALY # T01-186 (expires 09/01/2008). A primary copper stock was prepared on February 20, 2008, by adding 1.00003 g cupric sulfate pentahydrate to 1 liter de-ionized water in a volumetric flask.

2.4 LABWATER Test Dilutions for Study #3

Laboratory dilution water used for in-house cultures and toxicity testing was prepared on February 14, 2008, and was designated EPA-914. The water was prepared according to the procedure for obtaining moderately hard synthetic dilution water found in Section 7 of EPA 82-R-02-012, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*. Well water was obtained from an on-site well, and was filtered through catalytic carbon and a reverse osmosis membrane prior to the addition of reagent-grade chemicals. A copy of the documentation form for EPA-914 is provided in Appendix B. *Ceriodaphnia dubia* neonates used in the WER study were born into this batch of water.

A LABWATER sub-stock of cupric sulfate was prepared on February 21, 2008, by diluting 2 ml of the primary copper stock (see Section 2.3) to 500 ml with EPA-914. This provided a LABWATER sub-stock with a nominal copper concentration of 1 mg/L. The test dilutions were prepared by combining the LABWATER sub-stock with un-spiked EPA-914 to obtain the following nominal copper concentrations: 2.5, 3.9, 6.0, 9.1, 14, and 21 µg/L. Acid washed Class 'A' pipettes and cylinders were used to prepare sub-stocks and dilutions.

Table 1: Preparation of LABWATER test dilutions for the Louisa Regional STP WER study conducted February 21, 2008.

Treatment (% LABWATER Sub-stock)	Nominal Copper Concentration (µg/L)	LABWATER Sub-stock Added (ml)	Dilution
Lab. Control	0	0	To 600 ml with EPA-914
0.25	2.5	1.5	To 600 ml with EPA-914
0.39	3.9	2.3	To 600 ml with EPA-914
0.60	6.0	3.6	To 600 ml with EPA-914
0.91	9.1	5.5	To 600 ml with EPA-914
1.4	14	8.4	To 600 ml with EPA-914
2.1	21	12.6	To 600 ml with EPA-914

All LABWATER dilutions were prepared by 0845 on February 21, 2008. A 200 ml aliquot of each dilution was preserved with nitric acid for total copper analysis. A separate 200 ml aliquot was filtered at 0.45 µm using a new Nalgene® analytical filter unit and preserved with nitric acid for dissolved copper analysis. The remaining solution was used for toxicity testing.

2.5 SIMSTREAM Test Dilutions for Study #3

Simulated Stream water (SIMSTREAM) for Study #3 was prepared by combining Louisa Regional STP final effluent and upstream receiving stream water at the design low-flow conditions (Instream Waste Concentration, or IWC). The 7Q10 of the receiving stream is 0.003 MGD (Attachment 7 for VA0067954), so for a plant design flow of 0.8 MGD, the IWC is 99.6% effluent.

To prepare the SIMSTREAM, 20 ml of receiving stream water was screened at 60µm for indigenous organisms, and combined with 4980 ml effluent. Aliquots of LABWATER, SIMSTREAM, effluent, and receiving stream water were submitted for chemical characterization (see Section 2.6). The hardness value reported by the SHEALY analytical laboratory of 57 mg/L was used to normalize the SIMSTREAM test results to the permit hardness of 39 mg/L prior to the calculation of WER values.

A SIMSTREAM sub-stock of cupric sulfate was prepared by diluting 2 ml of the primary copper stock (see Section 2.3) to 500 ml with SIMSTREAM. This provided a sub-stock with a nominal copper concentration of 1.0 mg/L. The test dilutions were prepared by combining the SIMSTREAM sub-stock with un-spiked SIMSTREAM to obtain the following nominal copper concentrations: 32, 49, 75, 116, 179, 275, and 423 µg/L. Acid washed Class 'A' pipettes and cylinders were used to prepare sub-stocks and dilutions.

Table 2: Preparation of SIMSTREAM test dilutions for the Louisa Regional STP WER study conducted February 21, 2008.

Treatment (% SIMSTREAM Sub-stock)	Nominal Copper Concentration (µg/L)	SIMSTREAM Sub-stock Added (ml)	Dilution
Lab. Control	0	0	EPA-914
Rec. Stream	0	0	Receiving Stream
SIMSTREAM	0	0	SIMSTREAM
3.2	32	12.8	To 400 ml with SIMSTREAM
4.9	49	19.6	To 400 ml with SIMSTREAM
7.5	75	30.0	To 400 ml with SIMSTREAM
11.6	116	46.4	To 400 ml with SIMSTREAM
17.9	179	71.6	To 400 ml with SIMSTREAM
27.5	275	110	To 400 ml with SIMSTREAM
42.3	423	169	To 400 ml with SIMSTREAM

SIMSTREAM test dilutions were prepared by 1045 on February 21, 2008. A 125 ml aliquot of each dilution was preserved with nitric acid for total copper analysis. A separate 125 ml aliquot was filtered at 0.45 µm using a new Nalgene® analytical filter unit and preserved with nitric acid for dissolved copper analysis. The remaining solution was used for toxicity testing.

2.6 Analytical Profile of Test Waters

Table 3: Analytical measurements for LABWATER, effluent, SIMSTREAM, and receiving stream water taken February 21, 2008. Full analytical reports including complete metal scans are available in Appendix C.

Parameter	LABWATER	SIMSTREAM	Final Effluent	Receiving Stream
CBOD			<2.0 mg/L	
Specific Conductance	287 µmhos/cm	322 µmhos/cm	384 µmhos/cm	105 µmhos/cm
TSS	<4.0 mg/L	6.9 mg/L	10 mg/L	<4.0 mg/L
Alkalinity	62 mg/L	81 mg/L	40 mg/L	26 mg/L
TOC	<1.0 mg/L	9.9 mg/L	9.5 mg/L	4.3 mg/L
DOC	<0.5 mg/L	5.774 mg/L	6.652 mg/L	3.444 mg/L
Ammonia-N	<0.10 mg/L	<0.01 mg/L	0.28 mg/L	<0.10 mg/L
Hardness	88 mg/L	57 mg/L	57 mg/L	35 mg/L
Total Copper	<5.0 µg/L	14 µg/L	17 µg/L	<5.0 µg/L
Dissolved Copper	<5.0 µg/L	8.8 µg/L	7.0 µg/L	<5.0 µg/L

We investigated the alkalinity value for the SIMSTREAM of 81 mg/L. It should have been at or below 40 mg/L, since the effluent comprised over 99% of the SIMSTREAM. We had the sample re-analyzed twice with the same results. We then re-analyzed the effluent remaining in the CBOD sample container for alkalinity. Effluent alkalinity was confirmed at 40 mg/L. All other SIMSTREAM parameters are at expected levels.

2.7 Toxicity Test Results for Study #3

Test solutions were allowed to equilibrate at least 2 hours prior to test initiation. Each test treatment consisted of 4 test chambers with 5 *C. dubia* each, and one surrogate test chamber with 5 organisms for water chemistry measurements only (D.O., pH, and temperature). The test chambers for the LABWATER test, the SIMSTREAM test, and all surrogates were filled with test solution and randomized on a single test board. The test organisms were introduced into chambers by rows without de-randomizing the chambers at 1600 on February 21, 2008. Test organisms were obtained from in-house cultures with a traceable lineage. The *C. dubia* used in this test were designated B3248, and were born between 1630 on February 20, 2008, and 0830 on February 21, 2008. Test organisms were fed two hours prior to the initiation of the test during holding at 25±1°C, but food was not introduced into actual test solutions. Dissolved oxygen, pH, and temperature were measured for each test concentration at test initiation. The test board was placed in Incubator #4 set for a temperature of 25±1°C, and a 16 hour light / 8 hour dark cycle.

At 24 hours, the test board was removed from the incubator. D.O., pH, and temperature were recorded in the surrogate chambers for each test concentration. Mortality was recorded for each replicate, and the test board placed back into the incubator.

The toxicity tests were terminated on February 23, 2008, by 1615. Immediately after mortality was recorded, appropriate test solutions were filtered at 0.45 microns and preserved with nitric acid for dissolved copper analysis. Pre-packaged Nalgene® analytical filter units were used to filter the solutions. The solutions submitted were all controls, the highest LABWATER and SIMSTREAM test concentrations at which there was no mortality, all test concentrations having partial mortality, and the lowest LABWATER and SIMSTREAM test concentrations having complete mortality. Dissolved oxygen, pH, and temperature were measured for each test concentration at test termination.

Toxicity test reports for the LABWATER and both SIMSTREAM tests are available in Appendix B. Analytical reports are in Appendix C. All water chemistry parameters were within the expected ranges. Temperature remained within 25± 1°C, and D.O. remained well above the required 6.0 mg/L (EPA 821-R-02-012). Table 4 provides a summary of temperature and D.O. measurements taken during testing. Survival was 100% in the laboratory dilution water controls, receiving stream control, and un-spiked SIMSTREAM treatment.

Table 4: Summary of temperature and dissolved oxygen measurements taken during the *C. dubia* tests for the Louisa Regional STP WER study on February 21, 2008.

Test	Temperature Range (°C)	Average Temperature (°C)	D.O. Range (mg/L)	Average D.O. (mg/L)
LABWATER	24.0 – 24.7	24.4	6.75 – 8.46	8.24
SIMSTREAM	24.0 – 24.7	24.3	6.56 – 8.51	8.21

Table 5: Summary of toxicity test results and actual metal measurements for the Louisa Regional STP LABWATER test with *C. dubia* conducted February 21, 2008.

Treatment (% LABWATER Sub-stock)	Initial Concentration Copper Total / Dissolved (µg/L)	Final Concentration Copper Dissolved (µg/L)	Mortality at 48 Hours
Lab Control	<1.0 / <1.0	<1.0	0%
0.25	2.5 / 2.4	*	0%
0.39	3.6 / 3.7	*	0%
0.60	6.0 / 5.8	4.8	0%
0.91	9.3 / 9.1	13	80%
1.4	17 / 17	14	100%
2.1	24 / 24	*	100%

* Analysis of final dissolved copper is not required for this test concentration.

Table 6: Summary of toxicity test results and actual metal measurements for the Louisa Regional STP SIMSTREAM test with *C. dubia* conducted February 21, 2008.

Treatment (% SIMSTREAM Sub-stock)	Initial Concentration Copper Total / Dissolved (µg/L)	Final Concentration Copper Dissolved (µg/L)	Mortality at 48 Hours
Lab Control	<1.0 / <1.0	<1.0	0%
Rec. Stream	1.7 / 2.4	1.4	0%
SIMSTREAM	15 / 7.8	8.7	0%
3.2	53 / 40	*	0%
4.9	67 / 52	*	0%
7.5	100 / 75	*	0%
11.6	140 / 110	100	0%
17.9	200 / 150	150	10%
27.5	310 / 240	230	100%
42.3	470 / 360	*	100%

* Analysis of final dissolved copper is not required for this test concentration.

2.8 Final Copper WER Calculation for Study #3

EC50's were determined using measured total and dissolved copper values for test concentrations. The Probit Method could not be used since one of the tests did not have at least two concentrations with partial mortality. Instead, the Trimmed Spearman-Karber test (TOXCALC v5.0.23) was used to determine 48-hour EC50 values for the LABWATER and SIMSTREAM tests. A standard hardness of 39 mg/L was used to normalize all EC50 data prior to the calculation of WER values. The normalizing equation is from EPA 2001, Appendix B:

$$EC50_{(\text{standard hardness})} = EC50_{(\text{test hardness})} \text{ (standard hardness/test hardness)}^{0.9422} .$$

The EC50 for total copper in the LABWATER test was 8.290 µg/L. The EC50 was normalized from the reported hardness of 88 mg/L to a standard hardness of 39 mg/L using the published slope for copper of 0.9422, (EPA 2002). The normalized value became 3.851 µg/L total copper. The EC50 value for dissolved copper was 8.090 µg/L, and was normalized to 3.758 µg/L.

The EC50 for total copper in the SIMSTREAM test was 239.3 µg/L. The EC50 was normalized from the reported hardness of 57 mg/L to a standard hardness of 39 mg/L using the published slope for copper of 0.9422, (EPA 2002). The normalized value became 167.4 µg/L total copper. The EC50 value for dissolved copper was 182.5 µg/L, and was normalized to 127.6 µg/L.

The Streamlined Method requires that the WER be calculated by dividing the SIMSTREAM EC50 by the greater of either the LABWATER EC50 or the published SMAV (Species Mean Acute Value). For *C. dubia*, the SMAV for total copper at a hardness of 39 mg/L is 9.884 µg/L, and the SMAV for dissolved copper at a hardness of 39 mg/L is 9.105 µg/L (EPA 2001). Since the published SMAV values are greater than the normalized values derived from this study, they were used to calculate the total and dissolved WER values.

The total copper WER value for the study conducted February 21, 2008, with *C. dubia* is 16.94. The dissolved copper WER for the study is 14.01.

Table 7: Summary of copper EC50 values, the associated normalized values, and the calculated copper WER values for the Louisa Regional STP study conducted February 21, 2008, with *Ceriodaphnia dubia*.

	EC50 (µg/L Copper)		EC50 (µg/L Copper) Hardness normalized to 39 mg/L as $CaCO_3$		WER*	
Test	total	dissolved	total	dissolved	total	dissolved
LABWATER	8.290	8.090	3.851	3.758		
SIMSTREAM	239.3	182.5	167.4	127.6	**16.94**	**14.01**

* Uses SMAV values of 9.884 µg/L for total copper, and 9.105 µg/L for dissolved copper.

Section 3: FWER Calculation

Table 8: Copper WER values derived from the three studies performed for the Louisa Regional STP:

Study Date	Total Copper WER	Dissolved Copper WER
May 16, 2007	14.56	12.84
July 18, 2007	23.11	19.28
February 21, 2008	16.94	14.01

The Final WER (FWER) is calculated as the geometric mean of all valid sample WERs. The second sample (July 2007) was deemed 'invalid' due to an effluent TSS much higher than permit limits. If the May 2007 and the February 2008 WER values are used, the final WER value for total copper is **15.70**.

WER Adjustment to National Criteria:

The hardness used to determine copper limits in the VA0067954 Louisa permit is 39 mg/L. National criteria for copper listed in the permit for a hardness of 39 mg/L are 4.0 µg/L (chronic value) and 5.5 µg/L (acute value). According to 9 VAC 25-260, the criteria may be multiplied by the WER to establish an in-stream copper concentration that is protective for designated uses.

Site-Specific Chronic Criterion (CCC) = 4.0 (15.70) = **62.8 µg/l Cu**
Site-Specific Acute Criterion (CMC) = 5.5 (15.70) = **86.35 µg/l Cu.**

Section 4: Test Result Comparison

Table 9: Values published in EPA 2001 for copper toxicity to *Ceriodaphnia dubia*. The values listed were generated with *C. dubia* <24 hours old, at static conditions, and using measured copper values.

REFERENCE	HARDNESS USED IN STUDY (MG/L)	EC50 (UG/L)	EC50 NORMALIZED TO HARDNESS OF 25 MG/L
Dimond, W.F. 2000.	78	13.1	4.48
	90	8.88	2.66
	90	10.3	3.08
Tetra Tech. 1998	99	10.1	2.76
	70	14.65	5.55
	74	6.72	2.42
	72	6.59	2.43
Diamond et al. 1997b.	80	6.98	2.33
Neserke, G. 1994.	87.5	11.25	3.46
	80.8	13.17	4.36
	80.8	25.25	8.36
	60	11.25	4.93
	30	4.5	3.79

The values listed in EPA 2001 were included in this summary table only if they were generated using three criteria: 1) the *C. dubia* tested were less than 24 hours old, 2) the test was conducted under static conditions, and 3) measured copper values were used to determine EC50s. Using the EC50 values normalized to a hardness of 25 mg/L, the average total copper EC50 for the EPA values is 3.89 µg/L. The upper limit using 2 standard deviations is 7.29 µg/L, and the lower limit is 0.49 µg/L.

A copy of the recent Shealy Environmental Services reference control chart for copper is included as Appendix D. The control chart includes all copper studies in LABWATER from May 10, 2006, through January 22, 2008. All values were normalized to a hardness of 25 mg/L prior to inclusion in the chart. The control chart mean is 2.56 µg/L copper, with an upper limit of 3.59 µg/L and a lower limit of 1.53 µg/L.

Table 10 provides the *C.dubia* EC50 data from all three Louisa Regional STP WER studies in comparison to the EPA published copper EC50 values and Shealy Environmental Services, Inc. copper EC50 data.

Table 10: Comparison of EC50 values generated for *C. dubia* <24 hours old. All studies referenced were generated under static conditions with EC50 values calculated using measured total copper. All EC50 values are normalized to a hardness of 25 mg/L.

Study/Facility	Mean EC50 Value (µg/L)	Range (2SD) (µg/L)
Shealy Environmental Services, Inc.	2.56	1.53 – 3.59
Values Published in EPA 2001	3.893	0.49-7.29
Louisa STP Study #1	2.178	
Louisa STP Study #2	1.895	
Louisa STP Study #3	2.532	

Section 5: Blank Analysis Results

Blanks were collected for copper analysis at various points during the WER studies. All analytical reports for the blanks are provided in Appendix C.

For Study#3, the equipment blank, filtration blanks, resulted in non-detect copper values (<1.0 µg/L). All glassware blanks resulted in values less than 5 µg/L.

Section 6: References

US Environmental Protection Agency (1994). Interim Guidance on Determination and Use of Water-Effect Ratios for Metals. EPA 823-B-94-001. Office of Water, Washington, D.C.

US Environmental Protection Agency (1995). 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water. EPA 820-B-96-001. Office of Water, Washington, D.C.

US Environmental Protection Agency (2001). Streamlined Water-Effect Ratio Procedure for Discharges of Copper. EPA-822-R-01-005. Office of Water, Washington, D.C.

US Environmental Protection Agency (2002). Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition EPA 821-R-02-012. Environmental Research Laboratory, Duluth, MN.

US Environmental Protection Agency (2002). National Recommended Water Quality Criteria: 2002. EPA-822-R-02-047 November 2002. Office of Water, Washington, D.C.

STREAMLINED WER FOR COPPER REPORT SUPPLEMENTAL SAMPING EVENT

LOUISA COUNTY WATER AUTHORITY: LOUISA REGIONAL STP

MARCH 2008

This final report includes a full text report and all raw data including toxicity test reports and analytical reports for the February 20, 2008, sampling event.

APPENDIX A

SHEALY

...A / ...DE Chain of Custody Record

SHE...Y EN...ONM...TAL SERVICES, INC.
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number 07319

Client: SESI	Report to Contact: Beth Thompson	Telephone No. / Fax No. / E-mail:	Quote No.:
Address:	Sampler's Signature: X Elizabeth W. Thompson	Waybill No.:	Page 1 of 1
City / State / Zip Code:	Printed Name:	Analysis (Attach list if more space is needed.)	
Project Name: Dewberry / Louisa		Field Parameters (i.e., pH, temp., DO) can be recorded in check boxes.	
Project No.:	P.O. No.:		Lot No.: JB210666

Sample ID / Description (Containers for each sample may be combined on one line.)	Date Yr. 2008	Time 24-HOUR	G=Grab C=Composite	Collection Temp °C	Matrix: Aqueous	Matrix: Solid	No & Type of Containers by Preservative Type (P=Plastic / G=Glass / PG=Both): Unpres.	H_2SO_4	HNO_3	HCl	NaOH	Sodium Thiosulfate	Toxicity - WER	Total ICPMS Scan	Diss ICPMS Scan	Remarks / Cooler I.D.
Compositor Blank	Start								1							
	Finish 2/19	1150							P				X			
Effluent	Start 2/19	1200					1		1							
	Finish 2/20	1158					G		P				X	X		Filtration = 0.45 um
Filtration Blank	Start								1							Omit Mo, B, Sn, Ti
	Finish 2/20	1205							P				X (WT)	X		
Filtered Effluent	Start								1							
	Finish 2/20	1210							P					X		
	Start															
	Finish															

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

QC Requirements (Specify)

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

	Date	Time		Date	Time
1. Relinquished by: Elizabeth W. Thompson	2/21/08	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory Received by	2/21/08	0930

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on ice (Circle) (Yes) No Ice Pack — Receipt Temp. 3.8 °C — Temp. Blank (Y) N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Sample Receipt Checklist (SRC)

Client: SESI Cooler Inspected by/date: CB /02/21/08 Lot #: JB210068

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Airborne Exp ☐ Other			
Yes ☐	No ☐	NA ☑	1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?
Cooler ID/temperature upon receipt 3.8 °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C Method: ☐ Temperature Blank ☑ Against Bottles Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None			
If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.			
Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☐	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☐	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☑	No ☐	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☐	NA ☑	16. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☑	No ☐	NA ☐	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s)_____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number) _____.

Sample(s)_____ were received with bubbles >6 mm in diameter.

Sample(s)_____ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s)_____ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐ Did client respond: Yes ☐ No ☐

SESI employee:_____ Date of response: _____

Comments:_____

Lot: JB21068

Sample Receiving Summary

Printed: 02/21/2008 8:30:44 PM by CB

Quote: 11066
Client: (1164) Shealy Environmental Services, Inc. / Beth Thompson
Comments:
Project Name:
Project Number:
Analysis Due: 03/04/2008
Report Due: 03/07/2008

Project Manager: GRW
Program Area: SC - NPDES
PO Number:

Level 1 Review: CB
Level 2 Review: _____

Cooler #	Cooler ID (if applicable)	Temp (°C)	Comments
1		3.8	

Shealy ID: JB21068-001 Client ID: Receiving Stream Collected: 02/20/2008 at 1000 by EWT

Sample Receiving Matrix: Aqueous
Entered: 2/21/2008 by CB
Received: 02/21/2008 0930 by ECC
Receipt Method: Field Services

Sample Containers:	Qty	Sample Containers	Comments
	1	(033) No Sample Container	

Tests:	Method	Test	Prep Method	Protocol
	200.7	ICP Metals	200.7 PREP	Protocol 1

Shealy ID: JB21068-002 Client ID: Filtration Blank Collected: 02/20/2008 at 1045 by EWT

Sample Receiving Matrix: Aqueous
Entered: 2/21/2008 by CB
Received: 02/21/2008 0930 by ECC
Receipt Method: Field Services

Sample Containers:	Qty	Sample Containers	Comments
	1	(044) 250 mL P HNO3 (dissolved)	

Tests:	Method	Test	Prep Method	Protocol
	200.7	Dissolved ICP Metals	200.7 PREP	Protocol 1

Shealy ID: JB21068-003 Client ID: Rec. Stream- Filtered Collected: 02/20/2008 at 1050 by EWT

Sample Receiving Matrix: Aqueous
Entered: 2/21/2008 by CB
Received: 02/21/2008 0930 by ECC
Receipt Method: Field Services

Sample Containers:	Qty	Sample Containers	Comments
	1	(044) 250 mL P HNO3 (dissolved)	

Tests:	Method	Test	Prep Method	Protocol
	200.7	Dissolved ICP Metals	200.7 PREP	Protocol 1

Totals:	Samples	Sample Containers	Tests/Items
	3	3	3

(end of report)

SHEALY **Chain of Custody Record**

HE/ ENV NM AL VIC NC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 70705

Client	Report to Contact	Telephone No. / Fax No. / E-mail	Quote No.
SEST	Beth Thompson		
Address	Sampler's Signature	Waybill No.	Page 1 of 1
	X Elizabeth Thompson		
City / State / Zip Code	Printed Name	Analysis (Attach list if more space is needed.)	
Project Name: Dewberry / Louisa			

Project No.	P.O. No.			Matrix			No. of Containers by Preservative Type								Toxicity-WER	Total Icpms Scan	Diss Icpms Scan	Lot No.
Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit						JB21068
Receiving Stream	2/20/08	1000					2								X	X		Remarks / Cooler I.D.
Filtration Blank	2/20/08	1045							1								X	Omit B, Mo, Sn, Ti
Rec. Stream - Filtered	2/20/08	1050							1								X	Filter = 0.45 um

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☐ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Elizabeth Thompson	2/21/08	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Laboratory received by	2/21/08	0930

Comments

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack

Receipt Temp. 3.8 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Sample Receipt Checklist (SRC)

Client: SESI Cooler Inspected by/date: CB / 02/21/08 Lot #: JB210066

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Airborne Exp ☐ Other			
Yes ☐	No ☐	NA ☑	1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?
Cooler ID/temperature upon receipt 3.8 °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C Method: ☑ Temperature Blank ☐ Against Bottles Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None			
If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.			
Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☐	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☐	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☐	No ☑	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☐	NA ☑	16. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s)_____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number) _____.

Sample(s)_____ were received with bubbles >6 mm in diameter.

Sample(s)_____ were received with TRC >0.2 mg/L for NH3/ TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s)_____ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐ Did client respond: Yes ☐ No ☐

SESI employee:_____ Date of response: _____

Comments:_____

Lot: JB21066

Sample Receiving Summary

Printed: 02/21/2008 8:22:35 PM by CB

Quote: 11066
Client: (1164) Shealy Environmental Services, Inc. / Beth Thompson
Comments:
Project Name:
Project Number:
Analysis Due: 03/04/2008
Report Due: 03/07/2008

Project Manager: GRW
Program Area: SC - NPDES
PO Number:

Level 1 Review: CP
Level 2 Review: _____

Cooler #	Cooler ID (if applicable)	Temp (°C)	Comments
1		3.8	

Shealy ID: JB21066-001 Client ID: Compositor Blank Collected: 02/19/2008 at 1150 by EWT

Sample Receiving Matrix: Aqueous
Entered: 2/21/2008 by CB
Received: 02/21/2008 0932 by ECC
Receipt Method: Field Services

Sample Containers:	Qty	Sample Containers	Comments
	1	(007) 250 mL P HNO3	

Tests:	Method	Test	Prep Method	Protocol
	200.8	ICP-MS Metals no B,Mo,Si,Sn,Ti	200.2	Protocol 1

Shealy ID: JB21066-002 Client ID: Effluent Collected: 02/20/2008 at 1158 by EWT

Sample Receiving Matrix: Aqueous
Entered: 2/21/2008 by CB
Received: 02/21/2008 0932 by ECC
Receipt Method: Field Services

Sample Containers:	Qty	Sample Containers	Comments
	1	(007) 250 mL P HNO3	
	1	(033) No Sample Container	

Tests:	Method	Test	Prep Method	Protocol
	200.8	ICP-MS Metals no B,Mo,Si,Sn,Ti	200.2	Protocol 1

Shealy ID: JB21066-003 Client ID: Filtration Blank Collected: 02/20/2008 at 1205 by EWT

Sample Receiving Matrix: Aqueous
Entered: 2/21/2008 by CB
Received: 02/21/2008 0932 by ECC
Receipt Method: Field Services

Sample Containers:	Qty	Sample Containers	Comments
	1	(044) 250 mL P HNO3 (dissolved)	

Tests:	Method	Test	Prep Method	Protocol
	200.8	Dissolved ICP-MS Metals no B,Mo,Si,Sn,Ti	200.2	Protocol 1

Shealy ID: JB21066-004 Client ID: Filtered Effluent Collected: 02/20/2008 at 1210 by EWT

Sample Receiving Matrix: Aqueous
Entered: 2/21/2008 by CB
Received: 02/21/2008 0932 by ECC
Receipt Method: Field Services

Sample Containers:	Qty	Sample Containers	Comments
	1	(044) 250 mL P HNO3 (dissolved)	

Tests:	Method	Test	Prep Method	Protocol
	200.8	Dissolved ICP-MS Metals no B,Mo,Si,Sn,Ti	200.2	Protocol 1

Sample Receiving Summary

Client: phClient
Project Name: phProjectName
Project Number: phProjectNumber

Project Manager: phProjectManager
Program Area: phProgramArea
PO Number: phPONumber

Totals:	Samples	Sample Containers	Tests/Items
	4	5	4

(end of report)

WEATHER DATA SUMMARY
FACILITY: LOUISA, VA WWTP
SAMPLE DATE: FEB 19-20, 2008
SOURCE: NATIONAL WEATHER SERVICE LOUISA AIRPORT

Date	Low Temp (F)	High Temp (F)	Avg Temp (F)	Precip (IN)	Conditions
02/05/08	42	78	60	0.01	fog
02/06/08	64	75	70	0.04	rain
02/07/08	41	64	52	0	no significant weather observed
02/08/08	35	55	45	0	no significant weather observed
02/09/08	35	64	50	0	no significant weather observed
02/10/08	37	57	47	0	no significant weather observed
02/11/08	26	37	32	0	no significant weather observed
02/12/08	24	33	28	0.07	no significant weather observed
02/13/08	32	42	37	0.63	rain, snow
02/14/08	21	48	34	0	snow
02/15/08	35	62	48	0	no significant weather observed
02/16/08	35	51	43	0	no significant weather observed
02/17/08	37	51	44	0	no significant weather observed
02/18/08	44	71	58	0.07	rain
02/19/08	33	51	42	0	no significant weather observed
02/20/08	21	37	29	0	snow

BEAVER CREEK 02/20/2008

Measurement (Feet)	Depth (Ft)	Feet (W)	Flow (fs)	WxDxFlow (cfs)
BANK	0.00	0.50	0	0.0000
0.5	0.08	0.50	0.40	0.0160
1	0.08	0.50	0.3	0.0120
1.5	0.08	0.50	0.300	0.0120
2	0.17	0.50	0.22	0.0187
2.5	0.17	0.50	0.19	0.0162
3	0.17	0.50	0.2	0.0170
3.5	0.3	0.50	0.21	0.0315
4	0.3	0.50	0.21	0.0315
4.5	0.3	0.50	0.21	0.0315
5	0.4	0.50	0.21	0.0420
5.5	0.3	0.50	0.21	0.0315
6	0.04	0.50	0.21	0.0042
BANK	0	0.50	0	0.0000
			TOTAL =	**0.2641**

0.2641 CFS X 0.65 = 0.172 MGD

APPENDIX B

EPA WATER BATCH #: 914

FINAL PREP DATE: 2/14/08 **EXPIRATION DATE:** 2/28/08

INITIAL USE DATE: 2/19/08 **FINAL USE DATE:** 2/25/08

STEP 1 DATE: 2/13/08 ANALYST INITIALS: CAD

Carboy # 5 Final Volume: 200 L Well water conductivity: 2.6 µS

Reagent	SESI lot # / Expiration Date	Actual Amount Weighed (grams)
$MgSO_4$	T01-181 / 7.24.08	12.00081
$NaHCO_3$	T01-243 / 9-30-09	19.20071
KCL	T01-215 / 4-6-09	0.80013
$CaSO_4*2H_2O$	T01-212 / 3-21-09	12.00038

$MgSO_4$, $NaHCO_3$, and KCL are pre-dissolved and added to carboy with aeration.
$CaSO_4*2H_2O$ in 4liters well water is placed on stir plate for 24 hours to pre-dissolve.

STEP 2 DATE: 2/14/08 ANALYST INITIALS: CAD

$CaSO_4*2H_2O$ is added to carboy.
Na_2SeO_4 stock used: 12/28/08 mLs added to carboy: 10

STEP 3 DATE: 2/18/08 ANALYST INITIALS: CAD

Analysis	Result	Approximate Range
Final Conductivity (µs)	293	
Final pH (su)	7.46	7.4-7.8
Hardness (mg/l): by hand titration	86	
Hardness (mg/l): analytical lab	90	80-100
Alkalinity (mg/l): analytical lab	62	57-64

COMMENTS/ NOTES:

SHEALY ENVIRONMENTAL SERVICES, INC.

COPPER WATER-EFFECT RATIO STUDY / BIOASSAY DATA FORM

FACILITY: LOUISA REGIONAL STP	**TEST: LAB WATER TEST**
LAB DILUTION WATER ID: EPA 914	
HARDNESS: 88 mg/L	
SUBSTOCK: 4 mg $CuSO_4*5H_2O$ / liter EPA 914	

Test Species : *Ceriodaphnia dubia*	**Test Start Date/Time:** 02/21/2008 1600
Age: <24 hours	**Analyst Initials @ Start:** CAD
Source/Neonate ID: B3248	**24 hour Reading Time:** 02/22/2008 1515
Incubator #: 4	**Analyst Initials @ 24 hours:** CAD
Board #: ss	**Test End Date/Time:** 02/23/2008 1615
Thermometer #: 7235	**Analyst Initials @ End:** EWT

WATER CHEMISTRY DATA

Treatment % Substock	Temp. (°C) 0 Hrs.	D.O. (mg/l) 0 Hrs.	pH (SU) 0 Hrs.	Temp. (°C) 24 Hrs.	D.O. (mg/l) 24 Hrs.	pH (SU) 24 Hrs.	Temp. (°C) 48 Hrs.	D.O. (mg/l) 48 Hrs.	pH (SU) 48 Hrs.
0 (Lab Control)	24.0	8.03	7.89	24.1	6.80	7.86	24.5	8.46	7.93
0.25	24.0	8.07	7.97	24.1	6.82	8.13	24.5	8.43	7.96
0.39	24.1	8.09	8.03	24.1	6.81	8.09	24.4	8.43	7.96
0.60	24.1	8.10	8.02	24.1	6.81	8.06	24.5	8.41	8.02
0.91	24.0	8.10	8.00	24.1	6.81	8.04	24.2	8.41	8.01
1.4	24.0	8.06	7.99	24.1	6.79	8.03	24.4	8.42	7.99
2.1	24.1	8.04	7.99	24.0	6.75	8.02	24.7	8.44	8.01

Surrogate cups contain __5___ organisms at test initiation.

RESULTS

TOTAL COPPER LC50 = 8.290 µg/L **DISSOLVED COPPER LC50=** 8.090 µg/L

MORTALITY DATA: LOUISA REGIONAL STP / LABWATER TEST (02/21/2008)

Concentration % Substock	Measured µg/L Copper (Tot. / Diss.)	Rep.	# Dead 24 Hours	# Dead 48 Hours	% Mortality 48 Hours	Final µg/L Copper (Dissolved)
0 (Lab Control)	<1.0 / <1.0	A	0	0	0%	<1.0
		B	0	0		
		C	0	0		
		D	0	0		
0.25%	2.5 / 2.4	A	0	0	0%	*
		B	0	0		
		C	0	0		
		D	0	0		
0.39%	3.6 / 3.7	A	0	0	0%	*
		B	0	0		
		C	0	0		
		D	0	0		
0.6%	6.0 / 5.8	A	0	0	0%	4.8
		B	0	0		
		C	0	0		
		D	0	0		
0.91%	9.3 / 9.1	A	2	2	80%	13
		B	5	5		
		C	5	5		
		D	1	4		
1.4%	17 / 17	A	5	5	100%	14
		B	5	5		
		C	5	5		
		D	5	5		
2.1%	24 / 24	A	5	5	100%	*
		B	5	5		
		C	5	5		
		D	5	5		

*Final dissolved copper measurement is not required for this concentration.

Daphnid Acute Test-48 Hr Survival

Start Date:	02/21/08	Test ID:	LRLWTOTCU3	Sample ID:	
End Date:	02/23/08	Lab ID:		Sample Type:	
Sample Date:	02/20/08	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia
Comments:					

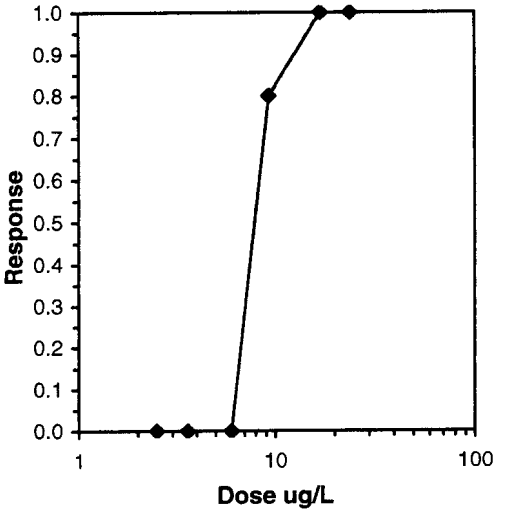
Conc-ug/L	1	2	3	4
D-Control	1.0000	1.0000	1.0000	1.0000
2.5	1.0000	1.0000	1.0000	1.0000
3.6	1.0000	1.0000	1.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000
9.3	0.6000	0.0000	0.0000	0.2000
17	0.0000	0.0000	0.0000	0.0000
24	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-ug/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
2.5	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
3.6	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
6	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
9.3	0.2000	0.2000	0.4502	0.2255	0.8861	69.198	4	16	20
17	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4	20	20
24	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4	20	20

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.52023	0.868	1.85413	9.13553
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	8.2899	7.5525	9.0992
5.0%	8.1378	7.3640	8.9930
10.0%	8.0132	7.2482	8.8590
20.0%	7.8906	7.4218	8.3890
Auto-0.0%	8.2899	7.5525	9.0992



Reviewed by: EWT

Daphnid Acute Test-48 Hr Survival

Start Date:	02/21/08	Test ID:	LRLWDISCU3	Sample ID:	
End Date:	02/23/08	Lab ID:		Sample Type:	
Sample Date:	02/20/08	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia

Comments:

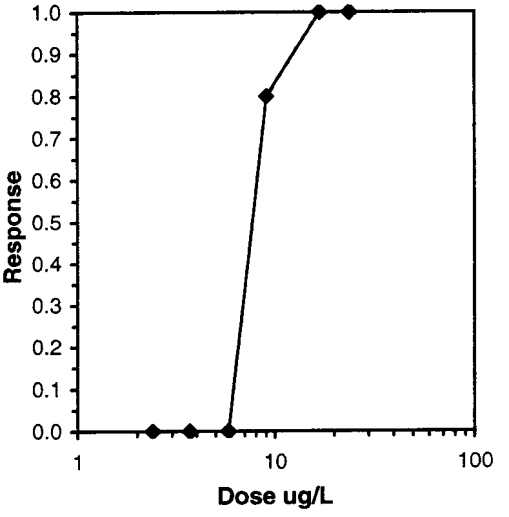
Conc-ug/L	1	2	3	4
D-Control	1.0000	1.0000	1.0000	1.0000
2.4	1.0000	1.0000	1.0000	1.0000
3.7	1.0000	1.0000	1.0000	1.0000
5.8	1.0000	1.0000	1.0000	1.0000
9.1	0.6000	0.0000	0.0000	0.2000
17	0.0000	0.0000	0.0000	0.0000
24	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-ug/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
2.4	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
3.7	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
5.8	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
9.1	0.2000	0.2000	0.4502	0.2255	0.8861	69.198	4	16	20
17	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4	20	20
24	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4	20	20

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.52023	0.868	1.85413	9.13553
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	8.0898	7.3479	8.9065
5.0%	7.9358	7.1580	8.7982
10.0%	7.8098	7.0416	8.6618
20.0%	7.6858	7.2169	8.1851
Auto-0.0%	8.0898	7.3479	8.9065



Reviewed by: EWT

SHEALY ENVIRONMENTAL SERVICES, INC.

COPPER WATER-EFFECT RATIO STUDY / BIOASSAY DATA FORM

FACILITY: LOUISA REGIONAL STP	**TEST: SIMULATED STREAM**
EFFLUENT ID: JB21066 COLLECTED 02/19/2008 1200 TO 02/20/2008 1158	
SIMULATED STREAM ID: 99.6% Effluent / 0.4% Beaver Creek	
LAB DILUTION WATER ID: EPA 914	
HARDNESS OF SIMSTREAM: 57 mg/L	
SUBSTOCK: 4 mg $CuSO_4*5H_2O$ / liter Simulated Stream water	

Test Species : *Ceriodaphnia dubia*	**Test Start Date/Time:** 02/21/2008 1600
Age: <24 hours	**Analyst Initials @ Start:** CAD
Source/Neonate ID: B3248	**24 hour Reading Time:** 02/22/2008 1515
Incubator #: 4	**Analyst Initials @ 24 hours:** CAD
Board #: ss	**Test End Date/Time:** 02/23/2008 1615
Thermometer #: 7235	**Analyst Initials @ End:** EWT

WATER CHEMISTRY DATA

Treatment % Substock	Temp (°C) 0 Hrs.	D.O. (mg/l) 0 Hrs.	pH (SU) 0 Hrs.	Temp. (°C) 24 Hrs.	D.O. (mg/l) 24 Hrs.	pH (SU) 24 Hrs.	Temp. (°C) 48 Hrs.	D.O. (mg/l) 48 Hrs.	pH (SU) 48 Hrs.
0 (Lab Control)	24.0	8.00	7.98	24.1	6.67	8.01	24.5	8.40	7.94
Receiving Stream	24.0	7.97	8.11	24.0	6.68	8.12	24.4	8.41	8.00
Simstream	24.0	8.04	7.87	24.1	6.70	7.92	24.4	8.42	7.84
3.2	24.1	8.03	7.84	24.1	6.69	7.88	24.5	8.45	7.84
4.9	24.1	8.04	7.81	24.0	6.66	7.86	24.7	8.45	7.84
7.5	24.1	8.02	7.79	24.1	6.65	7.84	24.5	8.51	7.84
11.6	24.0	8.00	7.76	24.1	6.63	7.81	24.4	8.46	7.85
17.9	24.0	7.96	7.74	24.1	6.62	7.80	24.6	8.45	7.83
27.5	24.0	7.92	7.72	24.0	6.60	7.79	24.5	8.42	7.83
42.3	24.1	7.96	7.71	24.1	6.56	7.79	24.5	8.41	7.84

Surrogate cups contain 5 organisms at test initiation.

RESULTS

TOTAL COPPER LC50 = 239.3 µg/L **DISSOLVED COPPER LC50=** 182.5 µg/L

MORTALITY DATA: LOUISA REGIONAL STP / SIMSTREAM TEST (02/21/2008)

Concentration % Substock	Concentration µg/L Copper (Tot. / Diss.)	Rep.	# Dead 24 Hours	# Dead 48 Hours	% Mortality 48 Hours	Final µg/L Copper (Dissolved)
0 (Lab Control)	<1.0 / <1.0	A	0	0	0%	<1.0
		B	0	0		
		C	0	0		
		D	0	0		
Receiving Stream	1.7 / 2.4	A	0	0	0%	1.4
		B	0	0		
		C	0	0		
		D	0	0		
Simstream	15 / 7.8	A	0	0	0%	8.7
		B	0	0		
		C	0	0		
		D	0	0		
3.2%	53 / 40	A	0	0	0%	*
		B	0	0		
		C	0	0		
		D	0	0		
4.9%	67 / 52	A	0	0	0%	*
		B	0	0		
		C	0	0		
		D	0	0		
7.5%	100 / 75	A	0	0	0%	*
		B	0	0		
		C	0	0		
		D	0	0		
11.6%	140 / 110	A	0	0	0%	100
		B	0	0		
		C	0	0		
		D	0	0		
17.9%	200 / 150	A	0	1	10%	150
		B	0	0		
		C	0	0		
		D	0	1		
27.5%	310 / 240	A	5	5	100%	230
		B	5	5		
		C	5	5		
		D	5	5		
42.3%	470 / 360	A	5	5	100%	*
		B	5	5		
		C	5	5		
		D	5	5		

*Final dissolved copper measurement is not required for this concentration.

Daphnid Acute Test-48 Hr Survival

Start Date:	02/21/08	Test ID:	LRSSTOTCU3	Sample ID:	
End Date:	02/23/08	Lab ID:		Sample Type:	
Sample Date:	02/20/08	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia

Comments:

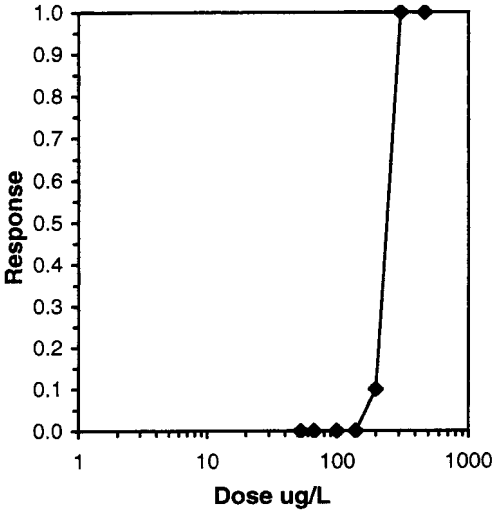
Conc-ug/L	1	2	3	4
D-Control	1.0000	1.0000	1.0000	1.0000
53	1.0000	1.0000	1.0000	1.0000
67	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000
140	1.0000	1.0000	1.0000	1.0000
200	0.8000	1.0000	1.0000	0.8000
310	0.0000	0.0000	0.0000	0.0000
470	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-ug/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
53	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
67	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
100	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
140	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
200	0.9000	0.9000	1.2262	1.1071	1.3453	11.212	4	2	20
310	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4	20	20
470	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4	20	20

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.57623	0.884	6.6E-15	4.03247
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	239.30	226.87	252.40
5.0%	241.97	226.56	258.43
10.0%	243.01	234.35	251.99
20.0%	243.01	234.35	251.99
Auto-0.0%	239.30	226.87	252.40



Reviewed by: EW/T

Daphnid Acute Test-48 Hr Survival

Start Date:	02/21/08	Test ID:	LRSSDISCU3	Sample ID:	
End Date:	02/23/08	Lab ID:		Sample Type:	
Sample Date:	02/20/08	Protocol:	EPAAW02-EPA/821/R-02-01	Test Species:	CD-Ceriodaphnia dubia

Comments:

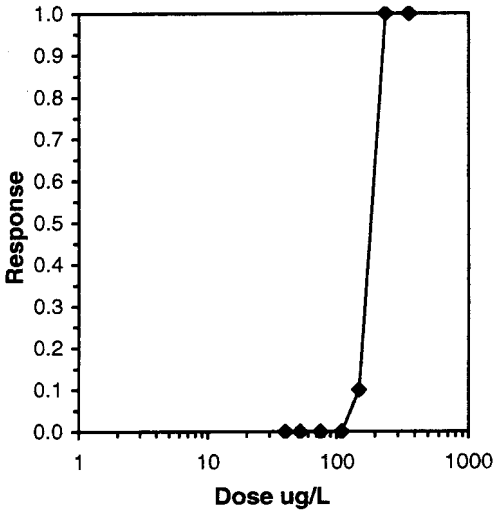
Conc-ug/L	1	2	3	4
D-Control	1.0000	1.0000	1.0000	1.0000
40	1.0000	1.0000	1.0000	1.0000
52	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000
110	1.0000	1.0000	1.0000	1.0000
150	0.8000	1.0000	1.0000	0.8000
240	0.0000	0.0000	0.0000	0.0000
360	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-ug/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
D-Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
40 ✓	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
52 ✓	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
75 ✓	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
110 ✓	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	0	20
150 ✓	0.9000	0.9000	1.2262	1.1071	1.3453	11.212	4	2	20
240 ✓	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4	20	20
360 ✓	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4	20	20

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.57623	0.884	6.6E-15	4.03247
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	182.48	173.17	192.28
5.0%	184.19	172.80	196.32
10.0%	184.85	177.79	192.18
20.0%	184.85	177.79	192.18
Auto-0.0%	182.48	173.17	192.28



ToxCalc v5.0.23

Reviewed by: EWT

APPENDIX C

SHEALY ENVIRONMENTAL SERVICES, INC.

Report of Analysis

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, SC 29172
Attention: Beth Thompson

Project Name: **Dewberry/Louisa**

Total and dissolved metal scans for effluent Compositor and Dissolved metal filtration blanks

Lot Number: **JB21066**

Date Completed: **02/28/2008**

Grant Wilton

Grant Wilton
Project Manager

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

Case Narrative
Shealy Environmental Services, Inc.
Lot Number: JB21066

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Summary
Shealy Environmental Services, Inc.
Lot Number: JB21066

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	Compositor Blank	Aqueous	02/19/2008 1150	02/21/2008
002	Effluent	Aqueous	02/20/2008 1158	02/21/2008
003	Filtration Blank	Aqueous	02/20/2008 1205	02/21/2008
004	Filtered Effluent	Aqueous	02/20/2008 1210	02/21/2008

(4 samples)

Executive Summary
Shealy Environmental Services, Inc.
Lot Number: JB21066

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	Compositor Blank	Aqueous	Manganese	200.8	13		ug/L	5
002	Effluent	Aqueous	Aluminum	200.8	150		ug/L	6
002	Effluent	Aqueous	Cadmium	200.8	0.26		ug/L	6
002	Effluent	Aqueous	Calcium	200.8	17000		ug/L	6
002	Effluent	Aqueous	Copper	200.8	17		ug/L	6
002	Effluent	Aqueous	Iron	200.8	160		ug/L	6
002	Effluent	Aqueous	Magnesium	200.8	3100		ug/L	6
002	Effluent	Aqueous	Manganese	200.8	14		ug/L	6
002	Effluent	Aqueous	Potassium	200.8	20000		ug/L	6
002	Effluent	Aqueous	Sodium	200.8	32000		ug/L	6
002	Effluent	Aqueous	Zinc	200.8	100		ug/L	6
004	Filtered Effluent	Aqueous	Dissolved Cadmium	200.8	0.21		ug/L	8
004	Filtered Effluent	Aqueous	Dissolved Calcium	200.8	17000		ug/L	8
004	Filtered Effluent	Aqueous	Dissolved Copper	200.8	7.0		ug/L	8
004	Filtered Effluent	Aqueous	Dissolved Iron	200.8	56		ug/L	8
004	Filtered Effluent	Aqueous	Dissolved Magnesium	200.8	3200		ug/L	8
004	Filtered Effluent	Aqueous	Dissolved Potassium	200.8	20000		ug/L	8
004	Filtered Effluent	Aqueous	Dissolved Sodium	200.8	31000		ug/L	8
004	Filtered Effluent	Aqueous	Dissolved Zinc	200.8	86		ug/L	8

(19 detections)

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21066-001**
Description: **Compositor Blank**
Matrix: **Aqueous**
Date Sampled: **02/19/2008 1150**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 0319	FTS	02/22/2008 1630	73801
2	200.2	200.8	1	02/26/2008 2149	FTS	02/22/2008 1630	73801
3	200.2	200.8	1	02/27/2008 2021	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Aluminum	7429-90-5	200.8	ND		50	ug/L	3
Antimony	7440-36-0	200.8	ND		5.0	ug/L	1
Arsenic	7440-38-2	200.8	ND		5.0	ug/L	1
Barium	7440-39-3	200.8	ND		25	ug/L	1
Beryllium	7440-41-7	200.8	ND		1.0	ug/L	3
Cadmium	7440-43-9	200.8	ND		0.10	ug/L	1
Calcium	7440-70-2	200.8	ND		5000	ug/L	1
Chromium	7440-47-3	200.8	ND		5.0	ug/L	1
Cobalt	7440-48-4	200.8	ND		5.0	ug/L	2
Copper	7440-50-8	200.8	ND		5.0	ug/L	1
Iron	7439-89-6	200.8	ND		20	ug/L	3
Lead	7439-92-1	200.8	ND		2.0	ug/L	1
Magnesium	7439-95-4	200.8	ND		50	ug/L	1
Manganese	**7439-96-5**	**200.8**	**13**		**10**	**ug/L**	**2**
Nickel	7440-02-0	200.8	ND		10	ug/L	2
Potassium	7440-09-7	200.8	ND		5000	ug/L	1
Selenium	7782-49-2	200.8	ND		5.0	ug/L	1
Silver	7440-22-4	200.8	ND		5.0	ug/L	1
Sodium	7440-23-5	200.8	ND		5000	ug/L	1
Thallium	7440-28-0	200.8	ND		0.50	ug/L	1
Vanadium	7440-62-2	200.8	ND		50	ug/L	2
Zinc	7440-66-6	200.8	ND		10	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21066-002**
Description: **Effluent**
Matrix: **Aqueous**
Date Sampled: **02/20/2008 1158**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 0328	FTS	02/22/2008 1630	73801
2	200.2	200.8	1	02/26/2008 2158	FTS	02/22/2008 1630	73801
3	200.2	200.8	1	02/27/2008 2030	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Aluminum	**7429-90-5**	**200.8**	**150**		**50**	**ug/L**	**3**
Antimony	7440-36-0	200.8	ND		5.0	ug/L	1
Arsenic	7440-38-2	200.8	ND		5.0	ug/L	1
Barium	7440-39-3	200.8	ND		25	ug/L	1
Beryllium	7440-41-7	200.8	ND		1.0	ug/L	3
Cadmium	**7440-43-9**	**200.8**	**0.26**		**0.10**	**ug/L**	**1**
Calcium	**7440-70-2**	**200.8**	**17000**		**5000**	**ug/L**	**1**
Chromium	7440-47-3	200.8	ND		5.0	ug/L	1
Cobalt	7440-48-4	200.8	ND		5.0	ug/L	2
Copper	**7440-50-8**	**200.8**	**17**		**5.0**	**ug/L**	**1**
Iron	**7439-89-6**	**200.8**	**160**		**20**	**ug/L**	**2**
Lead	7439-92-1	200.8	ND		2.0	ug/L	1
Magnesium	**7439-95-4**	**200.8**	**3100**		**50**	**ug/L**	**1**
Manganese	**7439-96-5**	**200.8**	**14**		**10**	**ug/L**	**2**
Nickel	7440-02-0	200.8	ND		10	ug/L	1
Potassium	**7440-09-7**	**200.8**	**20000**		**5000**	**ug/L**	**1**
Selenium	7782-49-2	200.8	ND		5.0	ug/L	1
Silver	7440-22-4	200.8	ND		5.0	ug/L	1
Sodium	**7440-23-5**	**200.8**	**32000**		**5000**	**ug/L**	**1**
Thallium	7440-28-0	200.8	ND		0.50	ug/L	1
Vanadium	7440-62-2	200.8	ND		50	ug/L	2
Zinc	**7440-66-6**	**200.8**	**100**		**10**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21066-003**
Description: **Filtration Blank**
Matrix: **Aqueous**
Date Sampled: **02/20/2008 1205**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 0338	FTS	02/22/2008 1630	73801
2	200.2	200.8	1	02/26/2008 2207	FTS	02/22/2008 1630	73801
3	200.2	200.8	1	02/27/2008 2039	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Aluminum	7429-90-5	200.8	ND		50	ug/L	3
Dissolved Antimony	7440-36-0	200.8	ND		5.0	ug/L	1
Dissolved Arsenic	7440-38-2	200.8	ND		5.0	ug/L	1
Dissolved Barium	7440-39-3	200.8	ND		25	ug/L	1
Dissolved Beryllium	7440-41-7	200.8	ND		1.0	ug/L	3
Dissolved Cadmium	7440-43-9	200.8	ND		0.10	ug/L	1
Dissolved Calcium	7440-70-2	200.8	ND		5000	ug/L	1
Dissolved Chromium	7440-47-3	200.8	ND		5.0	ug/L	1
Dissolved Cobalt	7440-48-4	200.8	ND		5.0	ug/L	2
Dissolved Copper	7440-50-8	200.8	ND		5.0	ug/L	1
Dissolved Iron	7439-89-6	200.8	ND		20	ug/L	3
Dissolved Lead	7439-92-1	200.8	ND		2.0	ug/L	1
Dissolved Magnesium	7439-95-4	200.8	ND		50	ug/L	1
Dissolved Manganese	7439-96-5	200.8	ND		10	ug/L	2
Dissolved Nickel	7440-02-0	200.8	ND		10	ug/L	1
Dissolved Potassium	7440-09-7	200.8	ND		5000	ug/L	1
Dissolved Selenium	7782-49-2	200.8	ND		5.0	ug/L	1
Dissolved Silver	7440-22-4	200.8	ND		5.0	ug/L	1
Dissolved Sodium	7440-23-5	200.8	ND		5000	ug/L	1
Dissolved Thallium	7440-28-0	200.8	ND		0.50	ug/L	1
Dissolved Vanadium	7440-62-2	200.8	ND		50	ug/L	2
Dissolved Zinc	7440-66-6	200.8	ND		10	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21066-004**
Description: **Filtered Effluent**
Matrix: **Aqueous**
Date Sampled: **02/20/2008 1210**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 0347	FTS	02/22/2008 1630	73801
2	200.2	200.8	1	02/26/2008 2216	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Aluminum	7429-90-5	200.8	ND		50	ug/L	2
Dissolved Antimony	7440-36-0	200.8	ND		5.0	ug/L	1
Dissolved Arsenic	7440-38-2	200.8	ND		5.0	ug/L	1
Dissolved Barium	7440-39-3	200.8	ND		25	ug/L	1
Dissolved Beryllium	7440-41-7	200.8	ND		1.0	ug/L	2
Dissolved Cadmium	**7440-43-9**	**200.8**	**0.21**		**0.10**	**ug/L**	**1**
Dissolved Calcium	**7440-70-2**	**200.8**	**17000**		**5000**	**ug/L**	**1**
Dissolved Chromium	7440-47-3	200.8	ND		5.0	ug/L	1
Dissolved Cobalt	7440-48-4	200.8	ND		5.0	ug/L	2
Dissolved Copper	**7440-50-8**	**200.8**	**7.0**		**5.0**	**ug/L**	**1**
Dissolved Iron	**7439-89-6**	**200.8**	**56**		**20**	**ug/L**	**2**
Dissolved Lead	7439-92-1	200.8	ND		2.0	ug/L	1
Dissolved Magnesium	**7439-95-4**	**200.8**	**3200**		**50**	**ug/L**	**1**
Dissolved Manganese	7439-96-5	200.8	ND		10	ug/L	2
Dissolved Nickel	7440-02-0	200.8	ND		10	ug/L	1
Dissolved Potassium	**7440-09-7**	**200.8**	**20000**		**5000**	**ug/L**	**1**
Dissolved Selenium	7782-49-2	200.8	ND		5.0	ug/L	1
Dissolved Silver	7440-22-4	200.8	ND		5.0	ug/L	1
Dissolved Sodium	**7440-23-5**	**200.8**	**31000**		**5000**	**ug/L**	**1**
Dissolved Thallium	7440-28-0	200.8	ND		0.50	ug/L	1
Dissolved Vanadium	7440-62-2	200.8	ND		50	ug/L	2
Dissolved Zinc	**7440-66-6**	**200.8**	**86**		**10**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

CWA / NPDES Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.shealylab.com

Number 07319

Client: SESI	Report to Contact: Beth Thompson	Telephone No. / Fax No. / E-mail:	Quote No.:
Address:	Sampler's Signature: x Elizabeth W. Thompson	Waybill No.:	Page 1 of 1
City / State / Zip Code:	Printed Name:	Analysis (Attach list if more space is needed)	
Project Name: Dewberry / Louisa		Field Parameters (i.e., pH, temp., DO) can be recorded in check boxes.	
Project No.:	P.O. No.:		Lot No.: JB21066

Sample ID / Description (Containers for each sample may be combined on one line.)	Date Yr. 2008	Time 24-HOUR	Grab / Composite	Collection Sample Type	Matrix: Aqueous	Matrix: Solid	No. & Type of Containers by Preservative Type (P-Plastic / G-Glass / *-Specify): Unpres	HNO3	HCl	NaOH	Sodium Thiosulfate	Toxicity - WER	Total Metals Scan	Diss. Metals Scan	Remarks / Cooler I.D.
Compositor Blank	Start						1								
	Finish 2/19	1150					P					X			
Effluent	Start 2/19	1200					1								
✓	Finish 2/20	1158					G			P		X	X		Filtration = 0.45 µm
Filtration Blank	Start						1								Omit Mo, B, Sn, Ti
	Finish 2/20	1205					P					X	X		
Filtered Effluent	Start						1								
	Finish 2/20	1210					P						X		
	Start														
	Finish														

Turn Around Time Required (Prior lab approval required for expedited TAT): ☐ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

QC Requirements (Specify):

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

	Date	Time		Date	Time
1. Relinquished by: Elizabeth W. Thompson	2/21/08	0932	1. Received by:		
2. Relinquished by:	Date	Time	2. Received by:	Date	Time
3. Relinquished by:	Date	Time	3. Received by:	Date	Time
4. Relinquished by:	Date	Time	4. Laboratory Received by:	Date 2/21/08	Time 0932

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

LAB USE ONLY Received on Ice (Circle) (Yes) No Ice Pack — Receipt Temp. 9.8 °C — Temp. Blank (Y) N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-I31 Effective Date: 3-01-06

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 6

Replaces Date: 09/22/06
Effective Date: 05/29/07

Sample Receipt Checklist (SRC)

Client: SESI Cooler Inspected by/date: CB / 02/21/08 Lot #: JB210066

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Airborne Exp ☐ Other			
Yes ☐	No ☐	NA ☑	1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?
Cooler ID/temperature upon receipt 3.8 °C / °C / °C / °C / °C / °C / °C / °C			
Method: ☑ Temperature Blank ☐ Against Bottles Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None			
If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.			
Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other: _____. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☐	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☐	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☐	No ☑	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☐	NA ☑	16. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number)

Sample(s) _____ were received with bubbles >6 mm in diameter.

Sample(s) _____ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s) _____ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐ Did client respond: Yes ☐ No ☐

SESI employee: _____ Date of response: _____

Comments: _____

SHEALY ENVIRONMENTAL SERVICES, INC.

Report of Analysis

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, SC 29172
Attention: Beth Thompson

Lot Number:**JB21063**
Date Completed:**Preliminary**

Initial Water Characterization

Grant Wilton
Project Manager

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

Case Narrative
Shealy Environmental Services, Inc.
Lot Number: JB21063

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Summary
Shealy Environmental Services, Inc.
Lot Number: JB21063

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	Labwater	Aqueous	02/21/2008 1200	02/21/2008
002	Simstream	Aqueous	02/21/2008 1221	02/21/2008
003	Effluent	Aqueous	02/20/2008 1200	02/21/2008
004	Rec. Stream	Aqueous	02/20/2008 1000	02/21/2008

(4 samples)

Executive Summary
Shealy Environmental Services, Inc.
Lot Number: JB21063

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	Labwater	Aqueous	Alkalinity	310.1	62		mg/L	5
001	Labwater	Aqueous	Hardness (total)	130.2	88		mg/L	5
001	Labwater	Aqueous	Specific Conductance	120.1	287		umhos/cm	5
001	Labwater	Aqueous	Dissolved Calcium	200.7	14		mg/L	6
001	Labwater	Aqueous	Dissolved Magnesium	200.7	12		mg/L	6
001	Labwater	Aqueous	Dissolved Sodium	200.7	27		mg/L	6
001	Labwater	Aqueous	Calcium	200.7	14		mg/L	7
001	Labwater	Aqueous	Magnesium	200.7	12		mg/L	7
001	Labwater	Aqueous	Sodium	200.7	26		mg/L	7
002	Simstream	Aqueous	Alkalinity	310.1	81		mg/L	8
002	Simstream	Aqueous	Hardness (total)	130.2	57		mg/L	8
002	Simstream	Aqueous	Specific Conductance	120.1	322		umhos/cm	8
002	Simstream	Aqueous	TOC	415.1	9.9		mg/L	8
002	Simstream	Aqueous	TSS	160.2	6.9		mg/L	8
002	Simstream	Aqueous	Dissolved Calcium	200.7	16		mg/L	9
002	Simstream	Aqueous	Dissolved Copper	200.7	0.0088		mg/L	9
002	Simstream	Aqueous	Dissolved Potassium	200.7	9.6		mg/L	9
002	Simstream	Aqueous	Dissolved Sodium	200.7	48		mg/L	9
002	Simstream	Aqueous	Dissolved Zinc	200.7	0.092		mg/L	9
002	Simstream	Aqueous	Aluminum	200.7	0.22		mg/L	10
002	Simstream	Aqueous	Calcium	200.7	16		mg/L	10
002	Simstream	Aqueous	Copper	200.7	0.014		mg/L	10
002	Simstream	Aqueous	Iron	200.7	0.12		mg/L	10
002	Simstream	Aqueous	Potassium	200.7	9.9		mg/L	10
002	Simstream	Aqueous	Sodium	200.7	45		mg/L	10
002	Simstream	Aqueous	Zinc	200.7	0.097		mg/L	10
003	Effluent	Aqueous	Alkalinity	310.1	40		mg/L	11
003	Effluent	Aqueous	Ammonia - N (phenate)	350.1	0.28		mg/L	11
003	Effluent	Aqueous	Hardness (total)	130.2	57		mg/L	11
003	Effluent	Aqueous	Specific Conductance	120.1	384		umhos/cm	11
003	Effluent	Aqueous	TOC	415.1	9.5		mg/L	11
003	Effluent	Aqueous	TSS	160.2	10		mg/L	11
004	Rec. Stream	Aqueous	Alkalinity	310.1	26		mg/L	12
004	Rec. Stream	Aqueous	Hardness (total)	130.2	35		mg/L	12
004	Rec. Stream	Aqueous	Specific Conductance	120.1	105		umhos/cm	12
004	Rec. Stream	Aqueous	TOC	415.1	4.3		mg/L	12

(36 detections)

Inorganic non-metals

Client: **Shealy Environmental Services, Inc.** Laboratory ID: **JB21063-001**

Description: **Labwater** Matrix: **Aqueous**

Date Sampled: **02/21/2008 1200**

Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Alkalinity) 310.1	1	02/26/2008 0113	IVC		73963
1	350.2	(Ammonia - N) 350.1	1	02/29/2008 1459	WD	02/28/2008 1902	74190
1		(DOC) 415.1	1				
1		(Hardness (to) 130.2	1	02/27/2008 1802	IVC		74140
1		(Specific Con) 120.1	1	02/26/2008 0102	IVC		73969
1		(TOC) 415.1	1	03/02/2008 1954	PBC		74401
1		(TSS) 160.2	1	02/25/2008 1618	PMM		73893

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Alkalinity		**310.1**	**62**		**10**	**mg/L**	**1**
Ammonia - N (phenate)		350.1	ND		0.10	mg/L	1
DOC		415.1	Pending		1.0	mg/L	1
Hardness (total)		**130.2**	**88**		**10**	**mg/L**	**1**
Specific Conductance		**120.1**	**287**		**2.00**	**umhos/cm**	**1**
TOC		415.1	ND		1.0	mg/L	1
TSS		160.2	ND		4.0	mg/L	1

PQL = Practical quantitation limit

ND = Not detected at or above the PQL

B = Detected in the method blank

J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21063-001**
Description: **Labwater**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1200**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 2003	KJC	02/22/2008 1320	73758
2	200.7	200.7	1	02/27/2008 1428	MNM	02/22/2008 1320	73758
3	200.7	200.7	1	03/03/2008 1832	MNM	03/02/2008 1518	74337

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Aluminum	7429-90-5	200.7	ND		0.20	mg/L	1
Dissolved Antimony	7440-36-0	200.7	ND		0.010	mg/L	2
Dissolved Arsenic	7440-38-2	200.7	ND		0.010	mg/L	1
Dissolved Barium	7440-39-3	200.7	ND		0.025	mg/L	1
Dissolved Beryllium	7440-41-7	200.7	ND		0.0040	mg/L	1
Dissolved Cadmium	7440-43-9	200.7	ND		0.0020	mg/L	1
Dissolved Calcium	**7440-70-2**	**200.7**	**14**		**5.0**	**mg/L**	**1**
Dissolved Chromium	7440-47-3	200.7	ND		0.0050	mg/L	1
Dissolved Cobalt	7440-48-4	200.7	ND		0.025	mg/L	1
Dissolved Copper	7440-50-8	200.7	ND		0.0050	mg/L	1
Dissolved Iron	7439-89-6	200.7	ND		0.10	mg/L	1
Dissolved Lead	7439-92-1	200.7	ND		0.010	mg/L	1
Dissolved Magnesium	**7439-95-4**	**200.7**	**12**		**5.0**	**mg/L**	**1**
Dissolved Manganese	7439-96-5	200.7	ND		0.015	mg/L	1
Dissolved Nickel	7440-02-0	200.7	ND		0.040	mg/L	1
Dissolved Potassium	7440-09-7	200.7	ND		5.0	mg/L	1
Dissolved Selenium	7782-49-2	200.7	ND		0.010	mg/L	1
Dissolved Silver	7440-22-4	200.7	ND		0.0050	mg/L	1
Dissolved Sodium	**7440-23-5**	**200.7**	**27**		**5.0**	**mg/L**	**3**
Dissolved Thallium	7440-28-0	200.7	ND		0.050	mg/L	1
Dissolved Vanadium	7440-62-2	200.7	ND		0.050	mg/L	1
Dissolved Zinc	7440-66-6	200.7	ND		0.020	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21063-001**
Description: **Labwater**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1200**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 1956	KJC	02/22/2008 1320	73758
2	200.7	200.7	1	02/27/2008 1421	MNM	02/22/2008 1320	73758
3	200.7	200.7	1	03/03/2008 1827	MNM	03/02/2008 1518	74337

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Aluminum	7429-90-5	200.7	ND		0.20	mg/L	1
Antimony	7440-36-0	200.7	ND		0.010	mg/L	2
Arsenic	7440-38-2	200.7	ND		0.010	mg/L	1
Barium	7440-39-3	200.7	ND		0.025	mg/L	1
Beryllium	7440-41-7	200.7	ND		0.0040	mg/L	1
Cadmium	7440-43-9	200.7	ND		0.0020	mg/L	1
Calcium	**7440-70-2**	**200.7**	**14**		**5.0**	**mg/L**	**1**
Chromium	7440-47-3	200.7	ND		0.0050	mg/L	1
Cobalt	7440-48-4	200.7	ND		0.025	mg/L	1
Copper	7440-50-8	200.7	ND		0.0050	mg/L	1
Iron	7439-89-6	200.7	ND		0.10	mg/L	1
Lead	7439-92-1	200.7	ND		0.010	mg/L	1
Magnesium	**7439-95-4**	**200.7**	**12**		**5.0**	**mg/L**	**1**
Manganese	7439-96-5	200.7	ND		0.015	mg/L	1
Nickel	7440-02-0	200.7	ND		0.040	mg/L	1
Potassium	7440-09-7	200.7	ND		5.0	mg/L	1
Selenium	7782-49-2	200.7	ND		0.010	mg/L	1
Silver	7440-22-4	200.7	ND		0.0050	mg/L	1
Sodium	**7440-23-5**	**200.7**	**26**		**5.0**	**mg/L**	**3**
Thallium	7440-28-0	200.7	ND		0.050	mg/L	1
Vanadium	7440-62-2	200.7	ND		0.050	mg/L	1
Zinc	7440-66-6	200.7	ND		0.020	mg/L	1

PQL = Practical quantitation limit
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Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

Inorganic non-metals

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21063-002**
Description: **Simstream**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1221**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Alkalinity) 310.1	1	03/11/2008 0030	IVC		74871
1	350.2	(Ammonia - N) 350.1	1	02/29/2008 1527	WD	02/28/2008 1902	74190
1		(DOC) 415.1	1				
1		(Hardness (to) 130.2	1	02/27/2008 1818	IVC		74140
1		(Specific Con) 120.1	1	02/26/2008 0143	IVC		73969
1		(TOC) 415.1	1	03/02/2008 2012	PBC		74401
1		(TSS) 160.2	1	02/26/2008 1718	PMM		73563

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Alkalinity		**310.1**	**81**		**10**	**mg/L**	**2**
Ammonia - N (phenate)		350.1	ND		0.10	mg/L	1
DOC		415.1	Pending		1.0	mg/L	1
Hardness (total)		**130.2**	**57**		**10**	**mg/L**	**1**
Specific Conductance		**120.1**	**322**		**2.00**	**umhos/cm**	**1**
TOC		**415.1**	**9.9**		**1.0**	**mg/L**	**1**
TSS		**160.2**	**6.9**		**4.0**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21063-002**
Description: **Simstream**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1221**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 2017	KJC	02/22/2008 1320	73758
2	200.7	200.7	1	02/27/2008 1441	MNM	02/22/2008 1320	73758
3	200.7	200.7	1	03/03/2008 1837	MNM	03/02/2008 1518	74337

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Aluminum	7429-90-5	200.7	ND		0.20	mg/L	1
Dissolved Antimony	7440-36-0	200.7	ND		0.010	mg/L	2
Dissolved Arsenic	7440-38-2	200.7	ND		0.010	mg/L	1
Dissolved Barium	7440-39-3	200.7	ND		0.025	mg/L	1
Dissolved Beryllium	7440-41-7	200.7	ND		0.0040	mg/L	1
Dissolved Cadmium	7440-43-9	200.7	ND		0.0020	mg/L	1
Dissolved Calcium	**7440-70-2**	**200.7**	**16**		**5.0**	**mg/L**	**1**
Dissolved Chromium	7440-47-3	200.7	ND		0.0050	mg/L	1
Dissolved Cobalt	7440-48-4	200.7	ND		0.025	mg/L	1
Dissolved Copper	**7440-50-8**	**200.7**	**0.0088**		**0.0050**	**mg/L**	**1**
Dissolved Iron	7439-89-6	200.7	ND		0.10	mg/L	1
Dissolved Lead	7439-92-1	200.7	ND		0.010	mg/L	1
Dissolved Magnesium	7439-95-4	200.7	ND		5.0	mg/L	1
Dissolved Manganese	7439-96-5	200.7	ND		0.015	mg/L	1
Dissolved Nickel	7440-02-0	200.7	ND		0.040	mg/L	1
Dissolved Potassium	**7440-09-7**	**200.7**	**9.6**		**5.0**	**mg/L**	**1**
Dissolved Selenium	7782-49-2	200.7	ND		0.010	mg/L	1
Dissolved Silver	7440-22-4	200.7	ND		0.0050	mg/L	1
Dissolved Sodium	**7440-23-5**	**200.7**	**48**		**5.0**	**mg/L**	**3**
Dissolved Thallium	7440-28-0	200.7	ND		0.050	mg/L	1
Dissolved Vanadium	7440-62-2	200.7	ND		0.050	mg/L	1
Dissolved Zinc	**7440-66-6**	**200.7**	**0.092**		**0.020**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21063-002**
Description: **Simstream**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1221**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 2010	KJC	02/22/2008 1320	73758
2	200.7	200.7	1	02/27/2008 1434	MNM	02/22/2008 1320	73758
3	200.7	200.7	1	03/03/2008 2057	MNM	03/02/2008 1518	74337

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Aluminum	**7429-90-5**	**200.7**	**0.22**		**0.20**	**mg/L**	**1**
Antimony	7440-36-0	200.7	ND		0.010	mg/L	2
Arsenic	7440-38-2	200.7	ND		0.010	mg/L	1
Barium	7440-39-3	200.7	ND		0.025	mg/L	1
Beryllium	7440-41-7	200.7	ND		0.0040	mg/L	1
Cadmium	7440-43-9	200.7	ND		0.0020	mg/L	1
Calcium	**7440-70-2**	**200.7**	**16**		**5.0**	**mg/L**	**1**
Chromium	7440-47-3	200.7	ND		0.0050	mg/L	1
Cobalt	7440-48-4	200.7	ND		0.025	mg/L	1
Copper	**7440-50-8**	**200.7**	**0.014**		**0.0050**	**mg/L**	**1**
Iron	**7439-89-6**	**200.7**	**0.12**		**0.10**	**mg/L**	**1**
Lead	7439-92-1	200.7	ND		0.010	mg/L	1
Magnesium	7439-95-4	200.7	ND		5.0	mg/L	1
Manganese	7439-96-5	200.7	ND		0.015	mg/L	1
Nickel	7440-02-0	200.7	ND		0.040	mg/L	1
Potassium	**7440-09-7**	**200.7**	**9.9**		**5.0**	**mg/L**	**1**
Selenium	7782-49-2	200.7	ND		0.010	mg/L	1
Silver	7440-22-4	200.7	ND		0.0050	mg/L	1
Sodium	**7440-23-5**	**200.7**	**45**		**5.0**	**mg/L**	**3**
Thallium	7440-28-0	200.7	ND		0.050	mg/L	1
Vanadium	7440-62-2	200.7	ND		0.050	mg/L	1
Zinc	**7440-66-6**	**200.7**	**0.097**		**0.020**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

Inorganic non-metals

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21063-003**
Description: **Effluent**
Matrix: **Aqueous**
Date Sampled: **02/20/2008 1200**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Alkalinity) 310.1	1	03/11/2008 0041	IVC		74871
1	350.2	(Ammonia - N) 350.1	1	02/29/2008 1528	WD	02/28/2008 1902	74190
1		(Carbonaceous) 405.1	1	02/27/2008 1319	SLH	02/22/2008 0912	4272
1		(DOC) 415.1	1				
1		(Hardness (to) 130.2	1	02/27/2008 1826	IVC		74140
1		(Specific Con) 120.1	1	02/26/2008 0222	IVC		73969
1		(TOC) 415.1	1	03/02/2008 2031	PBC		74401
1		(TSS) 160.2	1	02/26/2008 1718	PMM		73563

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Alkalinity		**310.1**	**40**		**10**	**mg/L**	**2**
Ammonia - N (phenate)		**350.1**	**0.28**		**0.10**	**mg/L**	**1**
Carbonaceous BOD, 5 day		405.1	ND		2.0	mg/L	1
DOC		415.1	Pending		1.0	mg/L	1
Hardness (total)		**130.2**	**57**		**10**	**mg/L**	**1**
Specific Conductance		**120.1**	**384**		**2.00**	**umhos/cm**	**1**
TOC		**415.1**	**9.5**		**1.0**	**mg/L**	**1**
TSS		**160.2**	**10**		**4.0**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
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J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21063-004**
Description: **Rec. Stream**
Matrix: **Aqueous**
Date Sampled: **02/20/2008 1000**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Alkalinity) 310.1	1	02/26/2008 0242	IVC		73963
1	350.2	(Ammonia - N) 350.1	1	03/03/2008 1854	WD	03/03/2008 1200	74405
1		(DOC) 415.1	1				
1		(Hardness (to) 130.2	1	02/27/2008 1843	IVC		74140
1		(Specific Con) 120.1	1	02/26/2008 0233	IVC		73969
1		(TOC) 415.1	1	03/02/2008 2126	PBC		74401
1		(TSS) 160.2	1	02/25/2008 1618	PMM		73893

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Alkalinity		**310.1**	**26**		**10**	**mg/L**	1
Ammonia - N (phenate)		350.1	ND		0.10	mg/L	1
DOC		415.1	Pending		1.0	mg/L	1
Hardness (total)		**130.2**	**35**		**10**	**mg/L**	1
Specific Conductance		**120.1**	**105**		**2.00**	**umhos/cm**	1
TOC		**415.1**	**4.3**		**1.0**	**mg/L**	1
TSS		160.2	ND		4.0	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

SHEALY

Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 70702

Client	SESI
Report to Contact	Beth Thompson
Telephone No. / Fax No. / E-mail	
Quote No.	
Address	
Sampler's Signature	x Elizabeth D. Thompson
Waybill No.	
Page	1 of 1
City / State / Zip Code	
Printed Name	
Project Name	Louisa WER
Project No.	
P.O. No.	
Lot No.	JB21043

Analysis (Attach list if more space is needed.)

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	Grab / Composite	Matrix: Aqueous	Solid	Non-aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Alkalinity	Conductivity	TSS	Total ICPMS scan	Diss ICPMS Scan	TOC	DOC	Ammonia	Hardness	CBOD	Remarks / Cooler I.D.
Labwater	2/21/08	1200					1	2	3				X	X	X	X	X	X	X	X	X		Diss ICPMS Scans were 0.45um filtered.
Simstream	2/21/08	1221					1	2	3				X	X	X	X	X	X	X	X	X		
Effluent	2/20/08	1200					2	2	1				X	X	X			X	X	X	X	X	Metals omit: B, Mo, Ti, Si, Sn
Rec. Stream	2/20/08	1000					1	2	1				X	X	X			X	X	X	X		

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Elizabeth D. Thompson	2/21/08	1410	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Laboratory received by: Christ Bow[illegible]	02/21/08	1410

Comments

LAB USE ONLY: Received on ice (Circle) Yes (No) Ice Pack — Receipt Temp. 17.6 °C

DISTRIBUTION: WHITE & YELLOW Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-012 Effective Date: 08-04-02

PRELIMINARY

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 6

Page: 1 of 1
Replaces Date: 09/22/06
Effective Date: 05/29/07

Sample Receipt Checklist (SRC)

Client: SESI Cooler Inspected by/date: CB / 02/21/08 Lot #: J821063

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Airborne Exp ☐ Other			
Yes ☐	No ☐	NA ☑	1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?
Cooler ID/temperature upon receipt 1 / 2.0 °C / °C / °C / °C / °C / °C / °C / °C			
Method: ☐ Temperature Blank ☐ Against Bottles Method of coolant: ☐ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None			
If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.			
Yes ☐	No ☑	NA ☐	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other: _____. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☐	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☐	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☑	No ☐	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☐	NA ☑	16. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☑	No ☐	NA ☐	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number)

Sample(s) _____ were received with bubbles >6 mm in diameter.

Sample(s) _____ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s) _____ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐ Did client respond: Yes ☐ No ☐

SESI employee: _____ Date of response: _____

Comments: _____

PRELIMINARY

SHEALY ENVIRONMENTAL SERVICES, INC.

Report of Analysis

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, SC 29172
Attention: Beth Thompson

Lot Number:**JB21068**
Date Completed:**03/04/2008**

Total and dissolved metal scans for Receiving Stream

Grant N Wilton

Grant Wilton
Project Manager

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

Case Narrative
Shealy Environmental Services, Inc.
Lot Number: JB21068

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Summary
Shealy Environmental Services, Inc.
Lot Number: JB21068

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	Receiving Stream	Aqueous	02/20/2008 1000	02/21/2008
002	Filtration Blank	Aqueous	02/20/2008 1045	02/21/2008
003	Rec. Stream- Filtered	Aqueous	02/20/2008 1050	02/21/2008

(3 samples)

Executive Summary
Shealy Environmental Services, Inc.
Lot Number: JB21068

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	Receiving Stream	Aqueous	Aluminum	200.7	0.33		mg/L	5
001	Receiving Stream	Aqueous	Barium	200.7	0.031		mg/L	5
001	Receiving Stream	Aqueous	Calcium	200.7	8.6		mg/L	5
001	Receiving Stream	Aqueous	Iron	200.7	1.1		mg/L	5
001	Receiving Stream	Aqueous	Manganese	200.7	0.047		mg/L	5
001	Receiving Stream	Aqueous	Sodium	200.7	7.6		mg/L	5
003	Rec. Stream- Filtered	Aqueous	Dissolved Calcium	200.7	7.8		mg/L	7
003	Rec. Stream- Filtered	Aqueous	Dissolved Iron	200.7	0.41		mg/L	7
003	Rec. Stream- Filtered	Aqueous	Dissolved Manganese	200.7	0.034		mg/L	7
003	Rec. Stream- Filtered	Aqueous	Dissolved Sodium	200.7	7.8		mg/L	7

(10 detections)

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21068-001**
Description: **Receiving Stream**
Matrix: **Aqueous**
Date Sampled: **02/20/2008 1000**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 2024	KJC	02/22/2008 1320	73758
2	200.7	200.7	1	02/27/2008 1507	MNM	02/22/2008 1320	73758
3	200.7	200.7	1	03/03/2008 1841	MNM	03/02/2008 1518	74337

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Aluminum	**7429-90-5**	**200.7**	**0.33**		**0.20**	**mg/L**	**1**
Antimony	7440-36-0	200.7	ND		0.010	mg/L	2
Arsenic	7440-38-2	200.7	ND		0.010	mg/L	1
Barium	**7440-39-3**	**200.7**	**0.031**		**0.025**	**mg/L**	**1**
Beryllium	7440-41-7	200.7	ND		0.0040	mg/L	1
Cadmium	7440-43-9	200.7	ND		0.0020	mg/L	1
Calcium	**7440-70-2**	**200.7**	**8.6**		**5.0**	**mg/L**	**1**
Chromium	7440-47-3	200.7	ND		0.0050	mg/L	1
Cobalt	7440-48-4	200.7	ND		0.025	mg/L	1
Copper	7440-50-8	200.7	ND		0.0050	mg/L	1
Iron	**7439-89-6**	**200.7**	**1.1**		**0.10**	**mg/L**	**1**
Lead	7439-92-1	200.7	ND		0.010	mg/L	1
Magnesium	7439-95-4	200.7	ND		5.0	mg/L	1
Manganese	**7439-96-5**	**200.7**	**0.047**		**0.015**	**mg/L**	**1**
Nickel	7440-02-0	200.7	ND		0.040	mg/L	1
Potassium	7440-09-7	200.7	ND		5.0	mg/L	1
Selenium	7782-49-2	200.7	ND		0.010	mg/L	1
Silver	7440-22-4	200.7	ND		0.0050	mg/L	1
Sodium	**7440-23-5**	**200.7**	**7.6**		**5.0**	**mg/L**	**3**
Thallium	7440-28-0	200.7	ND		0.050	mg/L	1
Vanadium	7440-62-2	200.7	ND		0.050	mg/L	1
Zinc	7440-66-6	200.7	ND		0.020	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21068-002**
Description: **Filtration Blank**
Matrix: **Aqueous**
Date Sampled: **02/20/2008 1045**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 2045	KJC	02/22/2008 1320	73758
2	200.7	200.7	1	02/27/2008 1514	MNM	02/22/2008 1320	73758
3	200.7	200.7	1	03/03/2008 1846	MNM	02/22/2008 1320	73758

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Aluminum	7429-90-5	200.7	ND		0.20	mg/L	1
Dissolved Antimony	7440-36-0	200.7	ND		0.010	mg/L	2
Dissolved Arsenic	7440-38-2	200.7	ND		0.010	mg/L	1
Dissolved Barium	7440-39-3	200.7	ND		0.025	mg/L	1
Dissolved Beryllium	7440-41-7	200.7	ND		0.0040	mg/L	1
Dissolved Cadmium	7440-43-9	200.7	ND		0.0020	mg/L	1
Dissolved Calcium	7440-70-2	200.7	ND		5.0	mg/L	1
Dissolved Chromium	7440-47-3	200.7	ND		0.0050	mg/L	1
Dissolved Cobalt	7440-48-4	200.7	ND		0.025	mg/L	1
Dissolved Copper	7440-50-8	200.7	ND		0.0050	mg/L	1
Dissolved Iron	7439-89-6	200.7	ND		0.10	mg/L	1
Dissolved Lead	7439-92-1	200.7	ND		0.010	mg/L	1
Dissolved Magnesium	7439-95-4	200.7	ND		5.0	mg/L	1
Dissolved Manganese	7439-96-5	200.7	ND		0.015	mg/L	1
Dissolved Nickel	7440-02-0	200.7	ND		0.040	mg/L	1
Dissolved Potassium	7440-09-7	200.7	ND		5.0	mg/L	1
Dissolved Selenium	7782-49-2	200.7	ND		0.010	mg/L	1
Dissolved Silver	7440-22-4	200.7	ND		0.0050	mg/L	1
Dissolved Sodium	7440-23-5	200.7	ND		5.0	mg/L	3
Dissolved Thallium	7440-28-0	200.7	ND		0.050	mg/L	1
Dissolved Vanadium	7440-62-2	200.7	ND		0.050	mg/L	1
Dissolved Zinc	7440-66-6	200.7	ND		0.020	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21068-003**
Description: **Rec. Stream- Filtered**
Matrix: **Aqueous**
Date Sampled: **02/20/2008 1050**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 2052	KJC	02/22/2008 1320	73758
2	200.7	200.7	1	02/27/2008 1521	MNM	02/22/2008 1320	73758
3	200.7	200.7	1	03/03/2008 1851	MNM	02/22/2008 1320	73758

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Aluminum	7429-90-5	200.7	ND		0.20	mg/L	1
Dissolved Antimony	7440-36-0	200.7	ND		0.010	mg/L	2
Dissolved Arsenic	7440-38-2	200.7	ND		0.010	mg/L	1
Dissolved Barium	7440-39-3	200.7	ND		0.025	mg/L	1
Dissolved Beryllium	7440-41-7	200.7	ND		0.0040	mg/L	1
Dissolved Cadmium	7440-43-9	200.7	ND		0.0020	mg/L	1
Dissolved Calcium	**7440-70-2**	**200.7**	**7.8**		**5.0**	**mg/L**	**1**
Dissolved Chromium	7440-47-3	200.7	ND		0.0050	mg/L	1
Dissolved Cobalt	7440-48-4	200.7	ND		0.025	mg/L	1
Dissolved Copper	7440-50-8	200.7	ND		0.0050	mg/L	1
Dissolved Iron	**7439-89-6**	**200.7**	**0.41**		**0.10**	**mg/L**	**1**
Dissolved Lead	7439-92-1	200.7	ND		0.010	mg/L	1
Dissolved Magnesium	7439-95-4	200.7	ND		5.0	mg/L	1
Dissolved Manganese	**7439-96-5**	**200.7**	**0.034**		**0.015**	**mg/L**	**1**
Dissolved Nickel	7440-02-0	200.7	ND		0.040	mg/L	1
Dissolved Potassium	7440-09-7	200.7	ND		5.0	mg/L	1
Dissolved Selenium	7782-49-2	200.7	ND		0.010	mg/L	1
Dissolved Silver	7440-22-4	200.7	ND		0.0050	mg/L	1
Dissolved Sodium	**7440-23-5**	**200.7**	**7.8**		**5.0**	**mg/L**	**3**
Dissolved Thallium	7440-28-0	200.7	ND		0.050	mg/L	1
Dissolved Vanadium	7440-62-2	200.7	ND		0.050	mg/L	1
Dissolved Zinc	7440-66-6	200.7	ND		0.020	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

SHEALY ENVIRONMENTAL SERVICES, INC.

SHEALY **Chain of Custody Record**

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 70705

Client: SESI	Report to Contact: Beth Thompson	Telephone No. / Fax No. / E-mail	Quote No.
Address	Sampler's Signature: x Elizabeth Thompson	Waybill No.	Page 1 of 1
City / State / Zip Code	Printed Name	Analysis (Attach list if more space is needed)	
Project Name: Dewberry / Louisa			
Project No. / P.O. No.			Lot No. JB21068

Sample ID / Description (Containers for each sample may be combined on one line)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	Other	Toxicity-WER	Total ICPMS 6020	Diss ICPMS 6020	Remarks / Cooler I.D.
1 Receiving Stream	2/20/08	1000					2						+	X		Omit B, Mo, Ln, Ti
Filtration Blank	2/20/08	1045							1						X	Filter = 0.45 um
Rec. Stream - Filtered	2/20/08	1050							1						X	

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☐ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Elizabeth Thompson	2/21/08	0930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Laboratory received by: [signature]	2/21/08	0930

Comments

LAB USE ONLY — Received on ice (Circle) (Yes) No Ice Pack — Receipt Temp. 3.8 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-012 Effective Date: 08-04-02

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 6

Page 1 of 1
Replaces Date: 09/22/06
Effective Date: 05/29/07

Sample Receipt Checklist (SRC)

Client: SESI Cooler Inspected by/date: CB / 02/21/08 Lot #: J8210168

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Airborne Exp ☐ Other			
Yes ☐	No ☐	NA ☑	1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?
Cooler ID/temperature upon receipt 3.8 °C / °C / °C / °C / °C / °C / °C / °C			
Method: ☐ Temperature Blank ☑ Against Bottles Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None			
If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.			
Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other: _____. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☐	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☐	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☑	No ☐	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☐	NA ☑	16. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☑	No ☐	NA ☐	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number)

Sample(s) _____ were received with bubbles >6 mm in diameter.

Sample(s) _____ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s) _____ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐ Did client respond: Yes ☐ No ☐

SESI employee: _____ Date of response: _____

Comments: _____

ANALYSIS REPORT
TIER 1 PACKAGE

DATA RESOURCES INC.
3005 BROAD RIVER ROAD
COLUMBIA SC 29210
BUS: 803-561-0331
FAX: 803-561-0536

ORDER ID: 080311X002
SAMPLE ID: 080311X002-01
PROJECT: DOC for WER Study
SAMPLE: Lab Control

Shealy Environmental Services Inc.
c/o Elizabeth Thompson
106 Vantage Point Drive
Cayce SC 29033

CUSTOMER ID: SESI
JOB ID: J4239
DIVISION: DRC
CREATED ON: 3/12/08
PAGE: 4

ANALYSIS or SERVICE PERFORMED	RESULT	UNIT	QUAL	RDL	MDL	METHOD	ANALYSIS D/T	ANALYST LOCATOR	PRIORITY
MATRIX: Liquid					**CUSTOMER SAMPLE ID:**				
COLLECTED ON: 2008-02-21									
COLLECTED BY: Elizabeth Thompson									
RECEIVED AT LAB: 2008-03-11 10:25:00.000									
Dissolved Organic carbon by EPA 415.1/SM 5310C						EPA 415.1/SM 5310C	2008-03-12 14:35	bparsons	*1 Day*
Dissolved Organic Carbon	**BDL**	mg/L		0.5	0.50000			DRC	

ONLINE ACCESS TO THIS INFORMATION: Go to http://DataResourcesInc.com and choose the menu option "CLIENT LOGIN" to enter the CDRC [Client Data Retrieval Center] and view PDF files of your invoices, analytical reports, correspondence and more...

CERTIFICATIONS: DRC SC#40569 | DRG SC#23108 *DocID: 1205357277*

ANALYSIS REPORT
TIER 1 PACKAGE

DATA RESOURCES INC.
3005 BROAD RIVER ROAD
COLUMBIA SC 29210
BUS: 803-561-0331
FAX: 803-561-0536

ORDER ID: 080311X002
SAMPLE ID: 080311X002-02
PROJECT: DOC for WER Study
SAMPLE: Effluent

Shealy Environmental Services Inc.
c/o Elizabeth Thompson
106 Vantage Point Drive
Cayce SC 29033

CUSTOMER ID: SESI
JOB ID: J4239
DIVISION: DRC
CREATED ON: 3/12/08
PAGE: 5

ANALYSIS or SERVICE PERFORMED	RESULT	UNIT	QUAL	RDL	MDL	METHOD	ANALYSIS D/T	ANALYST LOCATOR	PRIORITY
MATRIX: Liquid					**CUSTOMER SAMPLE ID:**				
COLLECTED ON: 2008-02-20									
COLLECTED BY: Elizabeth Thompson									
RECEIVED AT LAB: 2008-03-11 10:25:00.000									
Dissolved Organic carbon by EPA 415.1/SM 5310C						EPA 415.1/SM 5310C	2008-03-12 14:45	bparsons	*1 Day*
Dissolved Organic Carbon	**6.652**	mg/L		0.5	0.50000			DRC	

ONLINE ACCESS TO THIS INFORMATION: Go to http://DataResourcesInc.com and choose the menu option "CLIENT LOGIN" to enter the CDRC [Client Data Retrieval Center] and view PDF files of your invoices, analytical reports, correspondence and more...

CERTIFICATIONS: DRC SC#40569 | DRG SC#23108 *DocID: 1205357277*

DATA RESOURCES INC

ANALYSIS REPORT
TIER 1 PACKAGE

ORDER ID: 080311X002
SAMPLE ID: 080311X002-03
PROJECT: DOC for WER Study
SAMPLE: Receiving Room

Shealy Environmental Services Inc.
c/o Elizabeth Thompson
106 Vantage Point Drive
Cayce SC 29033

DATA RESOURCES INC.
3005 BROAD RIVER ROAD
COLUMBIA SC 29210
BUS: 803-561-0331
FAX: 803-561-0536

CUSTOMER ID: SESI
JOB ID: J4239
DIVISION: DRC
CREATED ON: 3/12/08
PAGE: 6

ANALYSIS or SERVICE PERFORMED	RESULT	UNIT	QUAL	RDL	MDL	METHOD	ANALYSIS D/T	ANALYST / LOCATOR	PRIORITY
MATRIX: Liquid			**CUSTOMER SAMPLE ID:**						
COLLECTED ON: 2008-02-20									
COLLECTED BY: Elizabeth Thompson									
RECEIVED AT LAB: 2008-03-11 10:25:00.000									
Dissolved Organic carbon by EPA 415.1/SM 5310C						EPA 415.1/SM 5310C	2008-03-12 14:55	bparsons	*1 Day*
Dissolved Organic Carbon	**3.444**	mg/L		0.5	0.50000			DRC	

ONLINE ACCESS TO THIS INFORMATION: Go to http://DataResourcesInc.com and choose the menu option "CLIENT LOGIN" to enter the CDRC [Client Data Retrieval Center] and view PDF files of your invoices, analytical reports, correspondence and more...

CERTIFICATIONS: DRC SC#40569 | DRG SC#23108 *DocID: 1205357277*

DATA RESOURCES INC

ANALYSIS REPORT
TIER 1 PACKAGE

ORDER ID: 080311X002
SAMPLE ID: 080311X002-04
PROJECT: DOC for WER Study
SAMPLE: Simstream

Shealy Environmental Services Inc.
c/o Elizabeth Thompson
106 Vantage Point Drive
Cayce SC 29033

DATA RESOURCES INC.
3005 BROAD RIVER ROAD
COLUMBIA SC 29210
BUS: 803-561-0331
FAX: 803-561-0536

CUSTOMER ID: SESI
JOB ID: J4239
DIVISION: DRC
CREATED ON: 3/12/08
PAGE: 7

ANALYSIS or SERVICE PERFORMED	RESULT	UNIT	QUAL	RDL	MDL	METHOD	ANALYSIS D/T	ANALYST / LOCATOR	PRIORITY
MATRIX: Liquid			**CUSTOMER SAMPLE ID:**						
COLLECTED ON: 2008-02-21									
COLLECTED BY: Elizabeth Thompson									
RECEIVED AT LAB: 2008-03-11 10:25:00.000									
Dissolved Organic carbon by EPA 415.1/SM 5310C						EPA 415.1/SM 5310C	2008-03-12 15:06	bparsons	*1 Day*
Dissolved Organic Carbon	**5.774**	mg/L		0.5	0.50000			DRC	

ONLINE ACCESS TO THIS INFORMATION: Go to http://DataResourcesInc.com and choose the menu option "CLIENT LOGIN" to enter the CDRC [Client Data Retrieval Center] and view PDF files of your invoices, analytical reports, correspondence and more...

CERTIFICATIONS: DRC SC#40569 | DRG SC#23108 *DocID: 1205357277*

SHEALY ENVIRONMENTAL SERVICES, INC.

Report of Analysis

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, SC 29172
Attention: Beth Thompson

Project Name: **Louisa LW**

Original copper values for LABWATER Test

Lot Number: **JB21071**

Date Completed: **03/03/2008**

Grant Wilton

Grant Wilton
Project Manager

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

Case Narrative
Shealy Environmental Services, Inc.
Lot Number: JB21071

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Summary

Shealy Environmental Services, Inc.

Lot Number: JB21071

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	Lab Control	Aqueous	02/21/2008 1202	02/21/2008
002	0.25	Aqueous	02/21/2008 1208	02/21/2008
003	0.39	Aqueous	02/21/2008 1210	02/21/2008
004	0.60	Aqueous	02/21/2008 1211	02/21/2008
005	0.91	Aqueous	02/21/2008 1213	02/21/2008
006	1.4	Aqueous	02/21/2008 1214	02/21/2008
007	2.1	Aqueous	02/21/2008 1215	02/21/2008

(7 samples)

Executive Summary

Shealy Environmental Services, Inc.

Lot Number: JB21071

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
002	0.25	Aqueous	Dissolved Copper	200.8	2.4		ug/L	7
002	0.25	Aqueous	Copper	200.8	2.5		ug/L	8
003	0.39	Aqueous	Dissolved Copper	200.8	3.7		ug/L	9
003	0.39	Aqueous	Copper	200.8	3.6		ug/L	10
004	0.60	Aqueous	Dissolved Copper	200.8	5.8		ug/L	11
004	0.60	Aqueous	Copper	200.8	6.0		ug/L	12
005	0.91	Aqueous	Dissolved Copper	200.8	9.1		ug/L	13
005	0.91	Aqueous	Copper	200.8	9.3		ug/L	14
006	1.4	Aqueous	Dissolved Copper	200.7	0.017		mg/L	15
006	1.4	Aqueous	Copper	200.7	0.017		mg/L	16
007	2.1	Aqueous	Dissolved Copper	200.7	0.024		mg/L	17
007	2.1	Aqueous	Copper	200.7	0.024		mg/L	18

(12 detections)

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-001**
Description: **Lab Control**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1202**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0102	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	7440-50-8	200.8	ND		1.0	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-001**
Description: **Lab Control**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1202**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0053	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	7440-50-8	200.8	ND		1.0	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-MS

Client: **Shealy Environmental Services, Inc.**

Laboratory ID: **JB21071-002**

Description: **0.25**

Matrix: **Aqueous**

Date Sampled: **02/21/2008 1208**

Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0120	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.8**	**2.4**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit

ND = Not detected at or above the PQL

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank

J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-002**
Description: **0.25**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1208**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0111	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.8**	**2.5**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**

Laboratory ID: **JB21071-003**

Description: **0.39**

Matrix: **Aqueous**

Date Sampled: **02/21/2008 1210**

Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0139	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.8**	**3.7**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit

ND = Not detected at or above the PQL

B = Detected in the method blank

J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-003**
Description: **0.39**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1210**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0129	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.8**	**3.6**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-004**
Description: **0.60**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1211**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0225	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.8**	**5.8**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-004**
Description: **0.60**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1211**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0148	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.8**	**6.0**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-005**
Description: **0.91**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1213**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0243	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.8**	**9.1**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis uniess flagged with a "W"

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-005**
Description: **0.91**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1213**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
3	200.2	200.8	1	02/29/2008 2256	FTS	02/28/2008 1212	74136

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.8**	**9.3**		**1.0**	**ug/L**	**3**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-006**
Description: **1.4**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1214**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 0034	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.017**		**0.0050**	**mg/L**	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-006**
Description: **1.4**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1214**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 0020	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.7**	**0.017**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21071-007**
Description: **2.1**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1215**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 0122	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.024**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**

Laboratory ID: **JB21071-007**

Description: **2.1**

Matrix: **Aqueous**

Date Sampled: **02/21/2008 1215**

Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 0054	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.7**	**0.024**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit

ND = Not detected at or above the PQL

B = Detected in the method blank

J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

SHEALY **Chain of Custody Record**

HE EN NM AL VIC NC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 70703

Client: SEST	Report to Contact: Beth Thompson	Telephone No. / Fax No. / E-mail:	Quote No.:
Address:	Sampler's Signature: x Elizabeth Thompson	Waybill No.:	Page 1 of 1
City / State / Zip Code:	Printed Name:	Analysis (Attach list if more space is needed.)	
Project Name: Louisa LW			

Project No.	P.O. No.			Matrix				No. of Containers by Preservative Type									Lot No.
Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous		Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit		ICPMS Total Diss Cu	ICP Total+Diss Cu	Remarks / Cooler I.D.
Lab Control	2/21/08	1202								2					X		JB21071
0.25		1208								2					X		Diss Cu Samples have been 0.45 um filtered.
0.39		1210								2					X		
0.60		1211								2					X		
0.91		1213								2					X		
1.4		1214								2						X	
2.1		1215								2						X	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☐ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Elizabeth Thompson	2/21/08	1410	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Laboratory received by	02/21/08	1410

Comments

LAB USE ONLY
Received on ice (Circle) Yes (No) Ice Pack

Receipt Temp. 17.8 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Sample Receipt Checklist (SRC)

Client: SESI Cooler Inspected by/date: CB /02/21/08 Lot #: JB21071

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Airborne Exp ☐ Other

Yes ☐	No ☐	NA ☑	1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?

Cooler ID/temperature upon receipt 12.8 °C ___/___ °C ___/___ °C ___/___ °C
___/___ °C ___/___ °C ___/___ °C ___/___ °C

Method: ☐ Temperature Blank ☑ Against Bottles
Method of coolant: ☐ Wet Ice ☐ Blue Ice ☐ Dry Ice ☑ None

If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.

Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☐	No ☐	NA ☑	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☐	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☑	No ☐	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☐	NA ☑	16. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s)_____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number)

Sample(s)_____ were received with bubbles >6 mm in diameter.

Sample(s)_____ were received with TRC >0.2 mg/L for NH3/ TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s)_____ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐ Did client respond: Yes ☐ No ☐

SESI employee:_____ Date of response:_____

Comments:_____

SHEALY ENVIRONMENTAL SERVICES, INC.

Report of Analysis

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, SC 29172
Attention: Beth Thompson

Project Name: **Louisa SS**

Original copper values for SIMSTREAM

Lot Number: **JB21070**

Date Completed: **03/03/2008**

Grant N Wilton

Grant Wilton
Project Manager

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

Case Narrative
Shealy Environmental Services, Inc.
Lot Number: JB21070

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Summary
Shealy Environmental Services, Inc.
Lot Number: JB21070

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	Lab Control	Aqueous	02/21/2008 1218	02/21/2008
002	Rec. Stream	Aqueous	02/21/2008 1219	02/21/2008
003	Simstream	Aqueous	02/21/2008 1222	02/21/2008
004	3.2	Aqueous	02/21/2008 1225	02/21/2008
005	4.9	Aqueous	02/21/2008 1230	02/21/2008
006	7.5	Aqueous	02/21/2008 1235	02/21/2008
007	11.6	Aqueous	02/21/2008 1236	02/21/2008
008	17.9	Aqueous	02/21/2008 1240	02/21/2008
009	27.5	Aqueous	02/21/2008 1243	02/21/2008
010	42.3	Aqueous	02/21/2008 1246	02/21/2008

(10 samples)

Executive Summary
Shealy Environmental Services, Inc.
Lot Number: JB21070

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
002	Rec. Stream	Aqueous	Dissolved Copper	200.8	2.4		ug/L	7
002	Rec. Stream	Aqueous	Copper	200.8	1.7		ug/L	8
003	Simstream	Aqueous	Dissolved Copper	200.8	7.8		ug/L	9
003	Simstream	Aqueous	Copper	200.8	15		ug/L	10
004	3.2	Aqueous	Dissolved Copper	200.7	0.040		mg/L	11
004	3.2	Aqueous	Copper	200.7	0.053		mg/L	12
005	4.9	Aqueous	Dissolved Copper	200.7	0.052		mg/L	13
005	4.9	Aqueous	Copper	200.7	0.067		mg/L	14
006	7.5	Aqueous	Dissolved Copper	200.7	0.075		mg/L	15
006	7.5	Aqueous	Copper	200.7	0.10		mg/L	16
007	11.6	Aqueous	Dissolved Copper	200.7	0.11		mg/L	17
007	11.6	Aqueous	Copper	200.7	0.14		mg/L	18
008	17.9	Aqueous	Dissolved Copper	200.7	0.15		mg/L	19
008	17.9	Aqueous	Copper	200.7	0.20		mg/L	20
009	27.5	Aqueous	Dissolved Copper	200.7	0.24		mg/L	21
009	27.5	Aqueous	Copper	200.7	0.31		mg/L	22
010	42.3	Aqueous	Dissolved Copper	200.7	0.36		mg/L	23
010	42.3	Aqueous	Copper	200.7	0.47		mg/L	24

(18 detections)

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-001**
Description: **Lab Control**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1218**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 2321	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	7440-50-8	200.8	ND		1.0	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-001**
Description: **Lab Control**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1218**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 2312	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	7440-50-8	200.8	ND		1.0	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-002**
Description: **Rec. Stream**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1219**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0007	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.8**	**2.4**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-002**
Description: **Rec. Stream**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1219**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	200.2	200.8	1	02/29/2008 2237	FTS	02/28/2008 1212	74136

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.8**	**1.7**		**1.0**	**ug/L**	**2**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Description: **Simstream**
Date Sampled: **02/21/2008 1222**
Date Received: **02/21/2008**

Laboratory ID: **JB21070-003**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0043	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.8**	**7.8**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-003**
Description: **Simstream**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1222**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/27/2008 0034	FTS	02/22/2008 1630	73802

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.8**	**15**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-004**
Description: **3.2**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1225**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 2106	KJC	02/22/2008 1320	73758

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.040**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-004**

Description: **3.2**
Matrix: **Aqueous**

Date Sampled: **02/21/2008 1225**

Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 2059	KJC	02/22/2008 1320	73758

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.7**	**0.053**		**0.0050**	**mg/L**	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-005**

Description: **4.9**
Matrix: **Aqueous**

Date Sampled: **02/21/2008 1230**

Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 2120	KJC	02/22/2008 1320	73758

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.052**		**0.0050**	**mg/L**	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-005**
Description: **4.9**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1230**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 2113	KJC	02/22/2008 1320	73758

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.7**	**0.067**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-006**
Description: **7.5**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1235**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/24/2008 2303	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.075**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Description: **7.5**
Date Sampled: **02/21/2008 1235**
Date Received: **02/21/2008**

Laboratory ID: **JB21070-006**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/24/2008 2257	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.7**	**0.10**		**0.0050**	**mg/L**	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-007**
Description: **11.6**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1236**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/24/2008 2317	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.11**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**

Laboratory ID: **JB21070-007**

Description: **11.6**

Matrix: **Aqueous**

Date Sampled: **02/21/2008 1236**

Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/24/2008 2310	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.7**	**0.14**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit

ND = Not detected at or above the PQL

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank

J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-008**
Description: **17.9**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1240**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/24/2008 2331	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.15**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-008**

Description: **17.9**
Matrix: **Aqueous**

Date Sampled: **02/21/2008 1240**

Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/24/2008 2324	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.7**	**0.20**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-009**
Description: **27.5**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1243**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/24/2008 2359	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.24**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-009**

Description: **27.5**
Matrix: **Aqueous**

Date Sampled: **02/21/2008 1243**

Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/24/2008 2338	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.7**	**0.31**		**0.0050**	**mg/L**	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-010**
Description: **42.3**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1246**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 0013	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.36**		**0.0050**	**mg/L**	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21070-010**
Description: **42.3**
Matrix: **Aqueous**
Date Sampled: **02/21/2008 1246**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/25/2008 0006	KJC	02/22/2008 1120	73759

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.7**	**0.47**		**0.0050**	**mg/L**	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

SHEALY **Chain of Custody Record**

HEA ENV NMT AL S VICE NC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 70704

Client: SEST	Report to Contact: Beth Thompson	Telephone No. / Fax No. / E-mail:	Quote No.:
Address:	Sampler's Signature: X Elizabeth D. Thompson	Waybill No.:	Page 1 of 1
City / State / Zip Code:	Printed Name:	Analysis (Attach list if more space is needed.)	
Project Name: Louisa SS			
Project No. / P.O. No.			Lot No.: JB21070

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	ICP Total + Diss Cu	ICP Total + Diss Cu	Remarks / Cooler I.D.
Lab Control	2/21/08	1218							2				X		Diss Cu Samples
Rec. Stream		1219							2				X		have been 0.45 um
Simstream		1222							2				X		filtered.
3.2		1225							2					X	
4.9		1230							2					X	
7.5		1235							2					X	
11.6		1236							2					X	
17.9		1240							2					X	
27.5		1243							2					X	
42.3		1246							2					X	

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☐ Standard ☐ Rush (Specify)

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished by: Elizabeth D. Thompson	2/21/08	1410	1. Received by:		
2. Relinquished by:			2. Received by:		
3. Relinquished by:			3. Laboratory received by: Christa Brown	02/21/08	1410

Comments:

LAB USE ONLY
Received on ice (Circle) Yes (No) Ice Pack
Receipt Temp. 17.8 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Sample Receipt Checklist (SRC)

Client: SESI Cooler Inspected by/date: CB / 02/21/08 Lot #: JB21070

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Airborne Exp ☐ Other			
Yes ☐	No ☐	NA ☑	1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?
Cooler ID/temperature upon receipt 17.8 °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C ___/___ °C			
Method: ☐ Temperature Blank ☑ Against Bottles Method of coolant: ☐ Wet Ice ☐ Blue Ice ☐ Dry Ice ☑ None			
If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.			
Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☐	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☐	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☑	No ☐	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☐	NA ☐	16. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☐	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☐	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s)_____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number) _____.

Sample(s)_____ were received with bubbles >6 mm in diameter.

Sample(s)_____ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s)_____ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐ Did client respond: Yes ☐ No ☐

SESI employee:_____ Date of response:_____

Comments:_____

Final Copper Values for Toxicity Tests

SHEALY ENVIRONMENTAL SERVICES, INC.

Report of Analysis

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, SC 29172
Attention: Beth Thompson

Project Name: **Finals**

Lot Number: **JB25009**
Date Completed: **02/28/2008**

Grant O N Wilton

Grant Wilton
Project Manager

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

Case Narrative
Shealy Environmental Services, Inc.
Lot Number: JB25009

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Summary
Shealy Environmental Services, Inc.
Lot Number: JB25009

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	LW Control	Aqueous	02/23/2008 1635	02/25/2008
002	LW 0.60	Aqueous	02/23/2008 1638	02/25/2008
003	LW 0.91	Aqueous	02/23/2008 1640	02/25/2008
004	LW 1.4	Aqueous	02/23/2008 1641	02/25/2008
005	SS Control	Aqueous	02/23/2008 1644	02/25/2008
006	Rec. Stream	Aqueous	02/23/2008 1645	02/25/2008
007	Simstream	Aqueous	02/23/2008 1647	02/25/2008
008	SS 11.6	Aqueous	02/23/2008 1648	02/25/2008
009	SS 17.9	Aqueous	02/23/2008 1650	02/25/2008
010	SS 27.5	Aqueous	02/23/2008 1651	02/25/2008
011	LW Blank	Aqueous	02/23/2008 1633	02/25/2008
012	SS Blank	Aqueous	02/23/2008 1643	02/25/2008

(12 samples)

Executive Summary

Shealy Environmental Services, Inc.

Lot Number: JB25009

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
002	LW 0.60	Aqueous	Dissolved Copper	200.8	4.8		ug/L	6
003	LW 0.91	Aqueous	Dissolved Copper	200.8	13		ug/L	7
004	LW 1.4	Aqueous	Dissolved Copper	200.7	0.014		mg/L	8
006	Rec. Stream	Aqueous	Dissolved Copper	200.8	1.4		ug/L	10
007	Simstream	Aqueous	Dissolved Copper	200.8	8.7		ug/L	11
008	SS 11.6	Aqueous	Dissolved Copper	200.7	0.10		mg/L	12
009	SS 17.9	Aqueous	Dissolved Copper	200.7	0.15		mg/L	13
010	SS 27.5	Aqueous	Dissolved Copper	200.7	0.23		mg/L	14

(8 detections)

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB25009-001**
Description: **LW Control**
Matrix: **Aqueous**
Date Sampled: **02/23/2008 1635**
Date Received: **02/25/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/28/2008 0046	FTS	02/25/2008 1604	73895

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	7440-50-8	200.8	ND		1.0	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**

Description: **LW 0.60**

Date Sampled: **02/23/2008 1638**

Date Received: **02/25/2008**

Laboratory ID: **JB25009-002**

Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/28/2008 0055	FTS	02/25/2008 1604	73895

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.8**	**4.8**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit

ND = Not detected at or above the PQL

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank

J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range

P = The RPD between two GC columns exceeds 40%

N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB25009-003**
Description: **LW 0.91**
Matrix: **Aqueous**
Date Sampled: **02/23/2008 1640**
Date Received: **02/25/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/28/2008 0104	FTS	02/25/2008 1604	73895

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.8**	**13**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB25009-004**
Description: **LW 1.4**
Matrix: **Aqueous**
Date Sampled: **02/23/2008 1641**
Date Received: **02/25/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/27/2008 1753	MNM	02/26/2008 1809	73987

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.014**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB25009-005**
Description: **SS Control**
Matrix: **Aqueous**
Date Sampled: **02/23/2008 1644**
Date Received: **02/25/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/28/2008 0113	FTS	02/25/2008 1604	73895

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	7440-50-8	200.8	ND		1.0	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB25009-006**
Description: **Rec. Stream**
Matrix: **Aqueous**
Date Sampled: **02/23/2008 1645**
Date Received: **02/25/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/28/2008 0122	FTS	02/25/2008 1604	73895

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.8**	**1.4**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB25009-007**
Description: **Simstream**
Matrix: **Aqueous**
Date Sampled: **02/23/2008 1647**
Date Received: **02/25/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/28/2008 0131	FTS	02/25/2008 1604	73895

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.8**	**8.7**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB25009-008**
Description: **SS 11.6**
Matrix: **Aqueous**
Date Sampled: **02/23/2008 1648**
Date Received: **02/25/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/27/2008 1800	MNM	02/26/2008 1809	73987

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.10**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB25009-009**
Description: **SS 17.9**
Matrix: **Aqueous**
Date Sampled: **02/23/2008 1650**
Date Received: **02/25/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/27/2008 1807	MNM	02/26/2008 1809	73987

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.15**		**0.0050**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-AES

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB25009-010**
Description: **SS 27.5**
Matrix: **Aqueous**
Date Sampled: **02/23/2008 1651**
Date Received: **02/25/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.7	200.7	1	02/27/2008 1814	MNM	02/26/2008 1809	73987

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Dissolved Copper	**7440-50-8**	**200.7**	**0.23**		**0.0050**	**mg/L**	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

SHEALY Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 70654

Client	Report to Contact	Telephone No. / Fax No. / E-mail	Quote No.
Address	Sampler's Signature	Waybill No.	Page ___ of ___
City / State / Zip Code	X_____ Printed Name	Analysis (Attach list if more space is needed.)	
Project Name			

Project No.	P.O. No.		G=Grab C=Composite	Matrix			No. of Containers by Preservative Type						Lot No.
Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time		Aqueous	Solid	Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Remarks / Cooler I.D.

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☐ Standard ☐ Rush (Specify)

QC Requirements (Specify)

1. Relinquished by	Date	Time	1. Received by	Date	Time
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Laboratory received by	Date	Time

Comments

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack

Receipt Temp. _____ °C

DIS TION. E & Y -Retu orator Sampl K-Fie t Copy

Shealy Environmental Services, Inc.
Document Number: F-AD-016
vision Number: 6

Replaces Date: 09/22/06
Effective Date: 05/29/07

Sample Receipt Checklist (SRC)

Client: SESI - TUX Cooler Inspected by/date: EEL 7/25/08 Lot #: JB25009

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Airborne Exp ☐ Other

Yes ☐	No ☑	NA ☐	1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☐	2. If custody seals were present, were they intact and unbroken?

Cooler ID/temperature upon receipt 2.4 °C / ___ °C ___ / ___ °C ___ / ___ °C
___ / ___ °C ___ / ___ °C ___ / ___ °C ___ / ___ °C

Method: ☐ Temperature Blank ☐ Against Bottles
Method of coolant: ☐ Wet Ice ☐ Blue Ice ☐ Dry Ice ☑ None

If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.

Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:_____. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☐	No ☐	NA ☑	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☐	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☑	No ☐	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☐	NA ☑	16. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s)_____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number)

Sample(s)_____ were received with bubbles >6 mm in diameter.

Sample(s)_____ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s)_____ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐ Did client respond: Yes ☐ No ☐

SESI employee:_____ Date of response:_____

Comments:_____

SHEALY ENVIRONMENTAL SERVICES, INC.

Report of Analysis

Shealy Environmental Services, Inc.
106 Vantage Point Drive
West Columbia, SC 29172
Attention: Beth Thompson

Lot Number:**JB21065**
Date Completed:**03/03/2008**
Date Revised:**03/03/2008**

Lab Equipment Blanks

Grant Wilton

Grant Wilton
Project Manager

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

Case Narrative
Shealy Environmental Services, Inc.
Lot Number: JB21065

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Summary
Shealy Environmental Services, Inc.
Lot Number: JB21065

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	Labwater Cylinder	Aqueous	02/20/2008	02/21/2008
002	Labwater Substock	Aqueous	02/20/2008	02/21/2008
003	Simstream Cylinder	Aqueous	02/20/2008	02/21/2008
004	Simstream Substock	Aqueous	02/20/2008	02/21/2008
005	Simstream Carboy	Aqueous	02/20/2008	02/21/2008
006	Pickle Jar 1	Aqueous	02/18/2008	02/21/2008
007	Pickle Jar 2	Aqueous	02/18/2008	02/21/2008

(7 samples)

Executive Summary
Shealy Environmental Services, Inc.
Lot Number: JB21065

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	Labwater Cylinder	Aqueous	Copper	200.8	1.3		ug/L	5
003	Simstream Cylinder	Aqueous	Copper	200.8	1.6		ug/L	7
006	Pickle Jar 1	Aqueous	Copper	200.8	4.6		ug/L	10

(3 detections)

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21065-001**
Description: **Labwater Cylinder**
Matrix: **Aqueous**
Date Sampled: **02/20/2008**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 0147	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.8**	**1.3**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21065-002**
Description: **Labwater Substock**
Matrix: **Aqueous**
Date Sampled: **02/20/2008**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	200.2	200.8	1	03/03/2008 1305	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	7440-50-8	200.8	ND		1.0	ug/L	2

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21065-003**
Description: **Simstream Cylinder**
Matrix: **Aqueous**
Date Sampled: **02/20/2008**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 0206	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.8**	**1.6**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21065-004**
Description: **Simstream Substock**
Matrix: **Aqueous**
Date Sampled: **02/20/2008**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 0243	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	7440-50-8	200.8	ND		1.0	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21065-005**
Description: **Simstream Carboy**
Matrix: **Aqueous**
Date Sampled: **02/20/2008**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 0252	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	7440-50-8	200.8	ND		1.0	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21065-006**
Description: **Pickle Jar 1**
Matrix: **Aqueous**
Date Sampled: **02/18/2008**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 0301	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	**7440-50-8**	**200.8**	**4.6**		**1.0**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

ICP-MS

Client: **Shealy Environmental Services, Inc.**
Laboratory ID: **JB21065-007**
Description: **Pickle Jar 2**
Matrix: **Aqueous**
Date Sampled: **02/18/2008**
Date Received: **02/21/2008**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	200.2	200.8	1	02/26/2008 0310	FTS	02/22/2008 1630	73801

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
Copper	7440-50-8	200.8	ND		1.0	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the PQL
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL

E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria

SHEALY **Chain of Custody Record**

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 70648

Client: SESI / Toxicity
Address:
City: State: Zip Code:
Report to Contact: Beth Thompson
Sampler's Signature: x Chelsea Durden
Printed Name: Chelsea Durden
Telephone No. / Fax No. / E-mail:
Waybill No.:
Quote No.:
Page 1 of 1
Project Name: Louisa WER Blanks
Project No.:
P.O. No.:
Lot No.: JB21065

Analysis (Attach list if more space is needed): ICP MS Total

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	Grab / Composite	Aqueous	Solid	Non Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	Other	ICP MS Total	Remarks / Cooler I.D.
Labwater Cylinder	2/21/08		G	✓					✓				✓	
Labwater Substock	↓		G	✓					✓				✓	
Simstream Cylinder	↓		G	✓					✓				✓	
Simstream Substock	↓		G	✓					✓				✓	
Simstream Carboy	↓		G	✓					✓				✓	
Pickle Jar 1	2/18/08		G	✓					✓				✓	
Pickle Jar 2	2/18/08		G	✓					✓				✓	

Possible Hazard Identification: ☐ Non Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

QC Requirements (Specify)

Relinquished by	Date	Time	Received by	Date	Time
1. Chelsea Durden	2/21/08	1410	1.		
2.			2.		
3.			3. Laboratory received by: Christ[illegible] B[illegible]	02/21/08	1410

Comments:

LAB USE ONLY: Received on Ice (Circle) Yes (No) Ice Pack — Receipt Temp. 17.8 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-012 Effective Date: 08-04-02

SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc. 106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Shealy Environmental Services, Inc.
Document Number: S-AD-01c
Revision Number: 6

Replaces Date: 06/22/06
Effective Date: 05/29/07

Sample Receipt Checklist (SRC)

Client: SESI Cooler Inspected by/date: CB / 02/21/08 Lot #: JB21065

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Airborne Exp ☐ Other

Yes ☐	No ☐	NA ☑	1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?

Cooler ID/temperature upon receipt 1.8 °C / °C / °C / °C / °C / °C / °C / °C

Method: ☐ Temperature Blank ☑ Against Bottles
Method of coolant: ☐ Wet Ice ☐ Blue Ice ☐ Dry Ice ☑ None

If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.

Yes ☐	No ☑	NA ☐	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other: _____. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☐	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☑	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☑	No ☐	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☐	NA ☑	16. Were bubbles present >"pea-size" (¼" or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number)

Sample(s) _____ were received with bubbles >6 mm in diameter.

Sample(s) _____ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s) _____ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐ Did client respond: Yes ☐ No ☐

SESI employee: _____ Date of response: _____

Comments: _____

SHEALY ENVIRONMENTAL SERVICES, INC.
ACUTE REFERENCE TOXICANT CONTROL CHART FOR *C.DUBIA*
REFERENCE TOXICANT = CUPRIC CHLORIDE
MARCH 2008

Values normalized to hardness of 25 mg/l

Data Point	Test Date	LC50 (48Hours)
1	05/10/06	2.457
2	06/07/06	2.089
3	06/28/06	3.449
4	08/09/06	2.217
5	08/30/06	2.159
6	09/13/06	3.147
7	09/27/06	2.668
8	10/25/06	2.995
9	11/29/06	2.33
10	12/13/06	2.565
11	01/17/07	2.494
12	03/15/07	2.582
13	05/16/07	2.178
14	05/25/07	3.482
15	06/21/07	2.248
16	07/18/07	1.895
17	07/25/07	1.832
18	08/22/07	3.553
19	12/18/07	2.311
20	01/22/08	2.56
	MEAN	**2.56055**
	SD	**0.513914234**
	2(SD)	**1.027828467**

UPPER LIMIT =3.59 UG/L
LOWER LIMIT = 1.53 UG/L